



**US Army Corps
of Engineers**

Philadelphia District

**DRAFT
SUPPLEMENTAL
ENVIRONMENTAL ASSESSMENT**

**FORT DELAWARE STATE PARK EROSION
CONTROL PROJECT: NORTH SHORELINE
PEA PATCH ISLAND OFF OF DELAWARE CITY,
NEW CASTLE COUNTY, DELAWARE**

**PREPARED BY:
PHILADELPHIA DISTRICT
U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA, PENNSYLVANIA 19107**

JULY 2003

Draft
Finding of No Significant Impact
Fort Delaware State Park Erosion Control Project (North Shoreline)
Pea Patch Island Off of Delaware City,
New Castle County, Delaware

OVERVIEW

The United States Army Corps of Engineers has evaluated the construction of a breakwater to protect a portion of historic Fort Delaware State Park that has been impacted by erosion, and to prevent further erosion to this area on Pea Patch Island, New Castle County, Delaware. The environmental assessment that has been prepared for this portion of the project supplements ones that were prepared in May 1999, June 2000, and May 2002 to include the northern extension of the breakwater.

PURPOSE AND SPECIFICATIONS

The proposed action is to protect and restore the eroding northeast shoreline of Pea Patch Island (approximately 1,600 feet of shoreline) and involves stone rubble breakwater construction and wetland/mudflat filling. The new stone rubble breakwater will be constructed along the line of the original breakwater. The new breakwater will be approximately 1,600 feet long, 40 feet wide, and 14 feet high, and consist of approximately 14,500 cubic yards of rip-rap.

COORDINATION

The Environmental Assessment for the project was coordinated with the U.S. Environmental Protection Agency Region III, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Delaware State Historic Preservation Officer, and the Delaware Department of Natural Resources and Environmental Control (DNREC), including the Division of Parks and Recreation, the Division of Soil and Water Conservation, the Division of Water Resources, and the Division of Fish and Wildlife. A Public Notice announcing the availability of the Environmental Assessment has been sent to all other known interested parties.

ENDANGERED SPECIES IMPACT

The Environmental Assessment has determined that the proposed activity is not likely to jeopardize the continued existence of any species or the critical habitat of any fish, wildlife or plant, which is designated as endangered or threatened pursuant to the Endangered Species Act of 1973 as amended by P.L. 96-159.

ESSENTIAL FISH HABITAT EVALUATION

An Essential Fish Habitat Evaluation that was performed as part of the June 2000 environmental assessment, under provisions of the reauthorized Magnuson-Stevens Fishery Conservation and Management Act of 1996 (P.L. 94-265) determined that no significant impacts would occur to species with Fishery Management Plans and their important prey species. Coordination with the NMFS indicates that this is still true.

WATER QUALITY/COASTAL ZONE COMPLIANCE

The Supplemental Environmental Assessment has concluded that the selected plan can be conducted in a manner which should not violate Delaware's Surface Water Quality Standards, as amended February 26, 1993. Pursuant to Section 401 of the Clean Water Act, a 401 Water Quality Certificate was requested from the DNREC. Based on the information developed during preparation of the Supplemental Environmental Assessment, and the application of appropriate measures to minimize project impacts, it was determined in accordance with Section 307(c) of the Coastal Zone Management Act of 1972, that the selected plan complies with and would be conducted in a manner that is consistent with the approved Coastal Zone Management Program of Delaware. No work will begin before a water quality certificate and a consistency determination are obtained.

CULTURAL IMPACTS

The project has the potential to impact significant cultural resources associated with the 19th century military occupation of Fort Delaware, Pea Patch Island, a property listed on the National Register of Historic Places. However, it is our position that the impacts can be avoided and/or minimized, and that measures can be taken to ensure that the project will have no adverse effect on historic resources. The Corps of Engineers, in consultation with DNREC, is coordinating Section 106 project review with the Delaware State Historic Preservation Office. This Section 106 coordination will be concluded prior to project construction.

CLEAN AIR ACT GENERAL CONFORMITY

An evaluation of projected emissions that would result during construction of this project was done to address the requirements of General Conformity of the Clean Air Act (42 U.S.C. 7401 et seq) for pollutants that are classified as being in non-attainment. The study indicates that emissions from the project will not exceed the threshold levels and the project will be in conformity with the Clean Air Act.

RECOMMENDATION

Because the Environmental Assessment concludes that the selected plan is not a major Federal action significantly affecting the human environment, I have determined that an Environmental Impact Statement is not required.

Date

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Lieutenant Colonel, Corps of Engineers
District Engineer

Fort Delaware State Park Erosion Control Project: North Shoreline
Pea Patch Island Off of Delaware City,
New Castle County, Delaware

Table of Contents

1.0 Introduction and Background	1
2.0 Purpose and Need for Action.....	2
3.0 Current Status of Project.....	3
4.0 Alternatives.....	4
5.0 Environmental Impacts	6
5.1 Noise Level and Air Quality	6
5.2 Water Quality.....	8
5.3 Wetlands and Other Special Aquatic Areas.....	8
5.4 Finfish	9
5.5 Benthos and Shellfish	9
5.6 Heron Rookery.....	9
5.7 Threatened and Endangered Species	9
5.8 Cultural Resources	9
5.9 Recreation	10
5.10 Ordnance and Explosives.....	11
5.11 Mitigation.....	11
5.12 Irreversible and Irretrievable Commitments of Resources.....	12
6.0 Coordination	12
7.0 Evaluation of Section 404(b)(1) Guidelines	15
8.0 Clean Air Act Statement Of Conformity.....	22
9.0 References.....	23

Appendices

Appendix A. Figures

Appendix B. Requests for Water Quality Certification and Coastal Zone Determination

Appendix C. Pertinent Correspondence and Coordination

Appendix D. General Conformity Review and Emission Inventory for the Pea Patch Island Erosion Control Project: North Shoreline.

List of Figures

- 1 Project Site
2. Stone Breakwater at 2:1 Slope
- 3 Typical Section of Breakwater
- 4 Breakwater, Plan View
- 5 Proposed mitigation site

1.0 Introduction and Background

The Fort Delaware State Park Erosion Control Project has been discussed in detail in three previous National Environmental Policy Act (NEPA) documents:

U.S. Army Corps of Engineers. 1999. *Final Environmental Assessment, Fort Delaware State Park Erosion Control Project, Pea Patch Island off Delaware City, New Castle County, Delaware*. May 1999.

U. S. Army Corps of Engineers. 2000. *Supplemental Environmental Assessment, Fort Delaware State Park Erosion Control Project: North Wall and Sluiceway, Pea Patch Island off Delaware City, New Castle County, Delaware*. June 2000.

U. S. Army Corps of Engineers. 2002. *Supplemental Environmental Assessment, Fort Delaware State Park Erosion Control Project, Pea Patch Island off Delaware City, New Castle County, Delaware*. May 2002.

These documents are incorporated into this supplemental environmental assessment (EA) by reference. This EA will describe the changes that have occurred to this project since the preparation of the previous three EAs. Only summary information will be presented to aid reader comprehension.

An edited discussion on the history of Fort Delaware and previous archaeological investigations can be found in "Final Environmental Assessment, Fort Delaware State Park Erosion Control Project, Pea Patch Island off Delaware City, New Castle County, Delaware" (May, 1999) and will not be repeated here. For more detailed information, the reader may also wish to refer to the other studies listed in the reference section of the final EA report.

In the "Supplemental Environmental Assessment, Fort Delaware State Park Erosion Control Project: North Wall and Sluiceway, Pea Patch Island off Delaware City, New Castle County, Delaware" (June 2000), the project's area of potential effect (APE) was expanded to include the sluiceway and 560 feet of shoreline north of the sluiceway in order to assess the potential impacts to historic properties associated with the proposed sluiceway restoration, new breakwater construction, and associated activities.

In the "Supplemental Environmental Assessment, Fort Delaware State Park Erosion Control Project, Pea Patch Island off Delaware City, New Castle County, Delaware" (May, 2002), the following changes were described:

1. Source of Fill. Approximately 32,500 cubic yards of primarily sand and gravel, to be placed behind the stone breakwaters, will be dredged from the Federal navigation channel immediately adjacent to the southeast corner of Pea Patch Island. This location has been previously dredged to maintain the navigation channel and the current dredging will be maintenance dredging for the current 40-foot navigation channel. The previously identified source of the majority of the

- fill had been material excavated from a proposed reconstructed swale, but this alternative proved to be infeasible (see “4” below).
2. North Sluice Gate Restoration. The sluice gate structure and winch for the drainage ditch behind the north breakwater feeding into the sluiceway would be reconstructed to agree with historical documents. However, the sluice gate will not be used as a gate. Rather, tidal water will flow unimpeded in and out through the sluice gate structure and a length of 24” diameter reinforced concrete pipe to maintain water flow in and out of a new drainage ditch, using the same technique used for the South Sluice Gate.
 3. Debris removal north of the sluiceway. Approximately 10 cubic yards of wood debris will be removed prior to filling behind the stone breakwaters. This material consists mostly of driftwood and will be deposited offsite or chipped and used on the island. Any trash would be legally disposed of off the island.
 4. Reconstructed Swale. A reconstructed swale that was proposed in the 1999 Environmental Assessment has been eliminated due to potential impacts to an existing yellow crowned night heron rookery, as well as cultural and engineering constraints. Elimination of the swale negates 1.54 acres of mitigation that had been proposed to compensate for filling wetlands and special aquatic sites. The Corps and the DNREC, Parks and Recreation propose to implement a mutually agreeable plan of action to compensate for the 1.54 acres that would have been replaced by the reconstructed swale. The concepts that will be investigated will include, but not be limited to, creating wetlands from uplands, additions to artificial reefs, and creating breakwaters to prevent erosion and/or restore existing wetlands on Pea Patch Island. One alternative that is being considered is using a staggered breakwater to protect the eroding wetlands at the southwest corner of Pea Patch Island and permit egress and ingress by mobile aquatic organisms such as fish.
 5. Erosion Protection for Heron Rookery. The proposal addressed preventing the continuing erosion in this area which is located on the north east side of the island where continuing erosion threatens to separate the heron colony from the rest of the island. Methods discussed include a staggered or segmented breakwater that would allow egress and ingress by mobile aquatic organisms such as fish.

2.0 Purpose and Need for Action

Fort Delaware State Park encompasses a 50 acre tract located on the southern half of Pea Patch Island, New Castle County, Delaware. The island is located in the middle of the Delaware River, approximately 1/2 mile east of Delaware City, Delaware, and measures 1 1/2 miles in length (north-south) by 1/2 mile at its widest point (Figure 1).

A tract on the northeast side of the park was retained by the U.S. Government when Fort Delaware and Pea Patch Island were turned over to the State of Delaware after World War II. The stone rubble breakwater that surrounds the historic island perimeter has been eroding and subsiding, allowing erosion of soil deposits to occur behind the breach. During high tides, currents and weather-generated waves undercut the bank. Large ships using the adjacent Delaware River Navigation Channel create increased wave action that

compounds the shoreline erosion. As described in the Final Environmental Assessment (Philadelphia District, May 1999), a breakwater was constructed in the winter of 1999 – 2000 to protect approximately 1000 feet of shoreline south of the sluiceway and the breakwater was extended northward for 650 feet of shoreline in the winter of 2002 - 2003. The existing sluiceway was also repaired.

Erosion of shoreline adjacent to the forested portion of the island and north of the previously constructed breakwaters continues due to the deterioration of the bank protection. Continued erosion of this shoreline would threaten the recently constructed breakwaters as well as the island as a whole with its unique cultural resources including significant historic archeological deposits and architectural features associated with the military occupation of Fort Delaware, a historically significant 19th century military fortification listed on the National Register of Historic Places. The continued erosion would also threaten the heron rookery, a significant biological resource. A satellite heronry of yellow-crowned night herons is located immediately west of this eroding shoreline.

Under Section 110 of the National Historic Preservation Act of 1966, as amended (NHPA), the U.S. Army Corps of Engineers, Philadelphia District, is responsible for the preservation and protection of significant cultural resources located on property under its jurisdiction or control. Therefore, in order to preserve and protect this National Register property, the Corps proposes to construct a new stone breakwater along the alignment of the former shore protection to restore this portion of the shoreline of Pea Patch Island.

Under Section 106 of the NHPA, the Philadelphia District evaluated potential impacts to cultural resources on Pea Patch Island as part of the proposed Delaware River Main Channel Deepening Project and found that channel deepening will have an adverse effect on significant archaeological deposits associated with Fort Delaware, Pea Patch Island. This proposed breakwater construction will eliminate impacts for the proposed channel deepening to this portion of the island.

This action concludes the responsibility of the Corps of Engineers under Section 110 of the National Historic Preservation Act of 1966, as amended (NHPA), since all of the land under its jurisdictional control will now be protected. However, other portions of the island such as the far northern portion where the majority of the wading bird colony exists is not protected and will be subject to further erosion. It is possible that the Corps and DNREC may formulate a project to protect this area under the Corps' Continuing Authorities Program (CAP).

3.0 Current Status of the Project.

The following items have been completed:

- a. A stone breakwater to protect the eroding southeast bank of Pea Patch Island. This new breakwater is approximately 1050 feet long, 40 feet wide, and 12 feet

- high, and consists of approximately 10,074 cubic yards of rip-rap. It was completed in January 2000.
- b. A stone breakwater to protect the eroding north wall of Pea Patch Island. The new breakwater is approximately 650 feet long, 40 feet wide, and 12 feet high, and consists of approximately 6,300 cubic yards of rip-rap. It was completed in March 2001.
 - c. The sluiceway, which measures 315 feet long, 25 feet wide, and 4.6 feet deep, was restored by excavating the silt down to approximately 1 foot above mean low water. Approximately 900 CY was excavated down to one foot above mean low water for the entire length. The existing stone breakwater was extended across the sluiceway to prevent trash from entering the sluiceway and to minimize the silt buildup within the sluiceway. A reinforced concrete pipe was constructed through the stone breakwater to allow water flow in and out of the sluiceway. This item was completed in March 2001.
 - d. The sluice gate and winch for the drainage ditch on the East Side of the sluiceway was reconstructed to agree with the historical documents. However, the sluice gate would not be used and the tidal flow in and out of the sluiceway and drainage ditch would be unimpeded. This item was completed in March 2001.
 - e. North Sluice Gate Restoration. The sluice gate structure and winch for the drainage ditch behind the north breakwater feeding into the sluiceway were reconstructed to agree with historical documents in 2003. However, the sluice gate will not be used as a gate. Rather, tidal water will flow unimpeded in and out through the sluice gate structure and a length of 24" diameter reinforced concrete pipe to maintain water flow in and out of a new drainage ditch, using the same technique used for the South Sluice Gate.

4.0 Alternatives

4.1 No Action

Under the no action alternative, erosion of the shoreline embankment would be permitted to continue unabated. As previously stated, this erosion threatens the recently constructed breakwaters as well as the island as a whole with its unique cultural resources including significant historic archeological deposits and architectural features associated with the military occupation of Fort Delaware, a historically significant 19th century military fortification listed on the National Register of Historic Places. The continued erosion would also threaten the heron rookery, a significant biological resource. Therefore, under this alternative the Corps will fail to fulfill its cultural resource management responsibilities at Fort Delaware as detailed under Sections 106 and 110 of the NHPA.

4.2 Non-Structural Alternatives

Navigation aids and pilot regulations were considered as an alternative that would mark and regulate movement of ships on the existing Delaware River Navigation Channel. This non-structural option would reduce additional erosion from occurring by slowing the

speed of large ships that travel the Main Channel. This would in turn decrease the amount of wave action hitting the Pea Patch Island shoreline.

Navigation aids include range lights, buoys, lightships, raycon beacons, maritime radio beacons, loran, fog signals, and sunken vessel markings, all of which are installed and maintained by the U.S. Coast Guard. These aids mark navigation channels and maneuvering areas for safe movement of vessels, and provide reference points by which pilots can determine vessel position and speed. The pilot's regulations for safe movement of vessels for the Delaware River are published in the Code of Federal Regulations, Title 33, Subchapter D. These regulations govern port and waterway safety, navigation rules, aids to navigation, and other areas of concern.

These regulations are established through a rather lengthy process, which includes public meetings and formal review and comment periods. Modification to these regulations is possible, though they have been established for safety and efficiency of operation. However, modifications to pilot regulations and navigation aids provide little opportunity for alleviating the identified erosion problem, as high tides and currents will continue to direct water into this area at a sufficient velocity to undercut the bank.

4.3 Stone Breakwater

This alternative places a new breakwater along the line of the original breakwater. It provides embankment stabilization and protection for unexposed archaeological deposits and the nearby yellow-crowned night heron colony. Under this alternative cultural features, including the original stone wall and grillage, and rail line would be recorded and then preserved by capping them with the new breakwater.

4.4 Bank Stabilization

This alternative includes several construction techniques that are appropriate for stabilizing eroding embankments. Each technique would differ from the others in the types of protection that would be provided. Types of protection considered for this project are riprap, bulkheads, gabion baskets (stone-filled wire baskets), interlocking concrete armor units and concrete mattresses.

Bank stabilization would protect intact archaeological deposits and architectural features buried along the riverbank that are presently being exposed and lost to erosion. However, bank stabilization would not protect the cultural features waterward of the bank, including the original stonewall, grillage, and rail line from continued erosion and destruction. For these reasons, bank stabilization along the existing riverbank would not fulfill the Corps' cultural resource management responsibilities at Fort Delaware, Pea Patch Island, under Sections 106 and 110 of the NHPA. Therefore the bank stabilization alternative was not selected.

4.5 Proposed Action

The proposed action is to protect and restore the eroding breakwater and shoreline north of the newly constructed breakwater on Pea Patch Island (approximately 1,600 feet of shoreline) and involves placement of stone rubble, filling of wetlands, and recording and capping historic resources (original stone wall and grillage, and rail line). A representative section will be identified, removed by the construction contractor and provided to the Delaware Division of Parks and Recreation (DNREC). A wooden pier, north of the stone breakwater will also be recorded; a stone with a bolt will also be recorded and removed by the construction contractor and provided to the Delaware Division of Parks and Recreation (DNREC). The restored stone rubble breakwater will exhibit an exterior appearance similar to the original breakwater as well as those constructed to the south, and will be constructed along the line of the original breakwater. The new breakwater will be approximately 1,600 feet long, 60 feet wide, and 14 feet high. The breakwater will consist of three distinct layers and sizes of stone. The core stone ranges in size from 3 inches to 7 inches. The underlayer stone ranges in weight from 60 to 120 pounds and has an average diameter of 10.5 inches. The outer layer of armor stone ranges in weight from 700 to 1200 pounds and has an average diameter of 24 inches. Approximately 14,500 cubic yards of stone will be needed (Figures 2, 3 and 4).

5.0 Environmental Impacts

Detailed descriptions of environmental impacts for the previous phases of the Pea Patch Island Erosion Control Project are provided in the 1999 EA and the 2000 and 2002 Supplemental EAs (SEA). Only impacts of proposed changes are discussed in this document.

5.1 Noise Level and Air Quality

Noise Level

Noise levels and air quality impacts would be limited to those produced by heavy construction equipment. Minor short-term impacts to air quality would result from the construction phase of restoring the breakwater. Ambient air quality would also be temporarily degraded, but emission controls and limited duration aid in minimizing the effects. No long-term significant impacts to the local air quality are anticipated. Since there are no permanent human residences on Pea Patch Island, any noise that results will not have a significant impact on people. See Section 5.6 for a discussion of noise impacts on the heron rookery. The impacts of noise on herons is also discussed in the 1999 EA and 2000 SEA.

Air Quality: General Conformity Review and Emissions Inventory

The 1990 Clean Air Act Amendments include the provision of Federal Conformity, which is a regulation that ensures that Federal Actions conform to a non-attainment

area's State Implementation Plan (SIP) thus not adversely impacting the area's progress toward attaining the National Ambient Air Quality Standards (NAAQS). In the case of the Fort Delaware State Park Erosion Control Project (North Shoreline) Project, the Federal Action is the construction of a breakwater to protect a portion of historic Fort Delaware State Park that has been impacted by erosion, and to prevent further erosion to this area on Pea Patch Island, New Castle County, Delaware. The U.S. Army Corps of Engineers, Philadelphia District would be responsible for construction. New Castle County, Delaware within which the Federal Action will take place is classified as severe non-attainment for ozone (oxides of nitrogen [NO_x] and volatile organic compounds [VOCs]). New Castle County, Delaware is within the Philadelphia-Wilmington-Trenton Non-attainment Area (PA-NJ-DE-MD).

There are two types of Federal Conformity: Transportation Conformity and General Conformity (GC). Transportation Conformity does not apply to this project because the project would not be funded with Federal Highway Administration money and it does not impact the on-road transportation system. GC however is applicable. Therefore, the total direct and indirect emissions associated with the Fort Delaware State Park Erosion Control Project (North Shoreline) must be compared to the GC trigger levels presented below. Calculations for the General Conformity review are presented in Appendix D.

Pollutant	General Conformity Trigger Levels (tons per year)
NO_x	25
VOCs	25

To conduct a general conformity review and emission inventory for the Fort Delaware State Park Erosion Control Project (North Shoreline), a list of equipment necessary for construction was identified. Pertinent pieces of equipment include: a 950 loader, 325 excavator, tugboat, crew survey/workboat, and derrick barge. Table 1 in Appendix D lists these pieces of equipment along with the number of engines, engine size (hp), and duration of operation. A Load Factor (LF) was also selected for each engine, which represents the average percentage of rated horsepower used during a source's operational profile. Load factors were taken from the General Conformity Review and Emission Inventory for the Delaware River Main Channel Deepening Project. The load factors for the loader and excavator were taken from the General Conformity Review and Emission Inventory for the Orchard Beach Renourishment Project The Bronx, New York.

Table 1 of Appendix D also shows the estimated hp-hr required for each equipment/engine category. Hp-hr was calculated using the following equation:

$$\text{hp-hr} = \# \text{ of engines} * \text{hp} * \text{LF} * \text{hrs/day} * \text{days of operation}$$

The second calculation is to derive the total amount of emissions generated from each equipment/engine category by multiplying the power demand (hp-hr) by an emission factor (g/hp-hr). The following equations were used:

$$\text{emissions (g)} = \text{power demand (hp-hr)} * \text{emission factor (g/hp-hr)}$$

$$\text{emissions (tons)} = \text{emissions (g)} * (1 \text{ ton}/907200 \text{ g})$$

Table 2 of Appendix D provides the NOx and VOC emission factors selected for each equipment/engine category. Tables 3 and 4 of Appendix D present the emission estimates for NOx and VOCs, respectively. The tables present the emissions from each individual equipment/engine category and the combined total.

The total estimated emissions that would result from construction of the Fort Delaware State Park Erosion Control Project (North Shoreline) are 4.41 tons of NOx and 0.15 tons of VOCs. These emissions are below the General Conformity trigger levels of 25 tons per year for each pollutant. General Conformity under the Clean Air Act, Section 176 has been evaluated for the project according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this project because the total direct and indirect emissions from the project are below the conformity threshold values established at 40 CFR 93.153 (b) for ozone (NOx and VOCs) in a Severe Non-attainment Area (25 tons of each pollutant per year). The project is not considered regionally significant under 40 CFR 93.153 (i). An additional 0.025 tons of NOx and 0.022 tons of VOC are estimated to be emitted from employees' vehicles commuting to and from work.

See Appendix D for supporting information and calculations.

5.2 Water Quality

Stone breakwater construction may have a short-term effect on turbidity levels. In the long term, the breakwater will greatly reduce the amount of sediment entering the water from bank erosion. The river current in this area should carry the limited turbidity out of the area quickly. High turbidity levels can stress aquatic organisms by clogging respiratory organs. The turbidity may also decrease hunting capacity of visual predators. The proposed project should have limited or no impact on pH, nutrient levels, bacteria, or DO. It also should not change the DRBC characterization of the water as fair to good.

5.3 Wetlands and Other Special Aquatic Areas

Construction of the breakwater will impact 2.2 acres of intertidal habitat that is mapped as "State Regulated Wetlands". Approximately 0.48 acres of intertidal habitat will be created on the water-ward face of the breakwater, bringing the net impact to 1.72 acres. When this is added to the wetlands impacted by previous phases of the project, the total impact is 5.36 acres.

5.4 Finfish

The project will have limited and short-term impacts on finfish. Fish are transient and mobile by nature and they can avoid the construction area. The primary impact to fisheries will be the loss of benthic and epibenthic communities in areas that will be filled. No subtidal habitat will be lost. The loss of the benthos and epibenthos smothered during stone placement and fill will permanently remove the food chain in the impact intertidal area (1.72 acres). Some colonization of the stone breakwater may occur which would provide a unique hard bottom habitat to the area. Post construction, the stone breakwater would provide structure and hiding places for small fish during high tide. The impacted area will be replaced, discussed in Section 5.11. An Essential Fish Habitat Evaluation is included in Appendix A of the 2000 Supplemental EA.

5.5 Benthos and Shellfish

Any benthic organisms, including shellfish, that occur in the 1.72 acres of intertidal habitat that will be impacted will be lost. No commercially or recreationally valuable species were observed on site visits by District biologists. Approximately 0.5 acres of intertidal habitat will be created on the surface of the breakwater.

5.6 Heron Rookery

To avoid impacts to nesting wading birds from noise and other construction related activities, no construction activities will be done between 15 February and 1 September.

The project will help protect the heron rookery by helping to stop erosion of Pea Patch Island.

5.7 Threatened and Endangered Species

No impacts are expected to occur, since there are no known Federally listed threatened or endangered species within the immediate project areas.

5.8 Cultural Resources

Construction activities associated with the proposed project have the potential to impact significant cultural resources in the stone-rubble breakwater placement area and the project area viewshed.

a. Stone-Rubble Breakwater Placement Area

Construction of a new stone-rubble breakwater structure will result in the placement of approximately 14,500 cubic yards of stone over an area measuring 1,650 feet long x 60 feet wide x 14 feet high. This activity has the potential to adversely impact three historic features. Stone-rubble will be placed directly on top of the original 19th century

breakwater and will completely cover exposed structural elements including original timber grillage, stone-rubble, and coursed masonry wall sections and a section of railroad.

b. Expanded Project Area Viewshed

Three historic buildings are located within the boundaries of the project's expanded viewshed and include: 1) Fort Delaware, 2) a maintenance building, and 3) a coal shed. Proposed construction activity will not directly or visually impact these structures.

Section 106 consultation is ongoing and will be concluded prior to any project activity.

c. Documentation of Historic Properties.

The District shall document the following: (1) the remains of the original stone wall, (2) timber grillage water-ward of the wall, (3) iron rails from a rail road, and (4) the remains of a pier using *Delaware Guidelines for Documentation of Historic Properties as Mitigation of an Adverse Effect Under Section 106 of the NHPA* (Attached as Appendix A). The “Measured Drawings” will not be required. The Contractor will record the corners of these properties using GPS.

1. Stonewall and grillage: The District will provide a plan view and profile of 2 locations where the relationship of the stonewall and the grillage are demonstrated. Each location is approximately 100 feet long and 30 feet wide. Exact locations were selected in coordination with the Corps of Engineers, the Delaware Division of Parks and Recreation (DNREC), and the Delaware State Historic Preservation Office (DESHPO). One of the recorded areas will include a repaired area of grillage where planks go from the grillage through the wall. This is an area near the south end of the visible wall.
2. Rail. Approximately 200 feet will be recorded. A representative section will be removed by the construction contractor and provided to the Delaware Division of Parks and Recreation (DNREC). The curve of the wall and rail at the north end of the island will be recorded.
3. A stone with a bolt will also be recorded and removed by the construction contractor and provided to the Delaware Division of Parks and Recreation (DNREC).

5.9 Recreation

The restoration of portions of Pea Patch Island that are eroding away should add to the experience of visitors who will be able to observe the area in a more historically accurate state.

5.10 Ordnance and Explosives

Since there is a potential for ordnance and explosives (OE) to occur at the construction site, and since intrusive work (such as excavation) is planned, a contractor, authorized in ordnance and explosives construction support will be available to perform on site inspections as construction is being performed. This condition will be required as part of the contract.

5.11 Mitigation

Mitigation measures are utilized to minimize or mitigate for project impacts to environmental resources within the project area. The appropriate application of mitigation is to formulate a project that first avoids and then minimizes adverse impacts and last, compensates for unavoidable impacts. Several measures have been adopted to avoid or minimize project impacts on effected resources such as cultural resources, wading birds, and noise. These are discussed in the May 1999 EA, the June 2000 SEA, and the May 2002 SEA. Changes and additions are discussed below.

The June 2000 SEA stated that DNREC, Parks and Recreation, and the Corps will implement a mutually agreeable plan of action to compensate for the impacted 2.10 acres of wetlands and special aquatic habitat that will be impacted by this project. As discussed in the May 2002 EA, the 1.54 acre swale that was originally planned and would have compensated for some of the wetland loss was no longer feasible. This brought the wetland impact for the first two phases of the project to 3.64 acres. When the wetland impacts for the current project (1.72 acres) are added, the total wetland impact is 5.36 acres. In the May 2002 EA a conceptual plan had been developed that would consist of staggered segments of breakwater made from geotextile tubes, rock, wood, or other suitable material to protect the northeast shoreline of Pea Patch Island . This area is experiencing severe erosion that threatens the main heron rookery. This method would add erosion protection and some accretion to create shallow water habitat and intertidal wetlands, and still permit access to aquatic organisms. Resource agencies attending a coordination meeting on April 26, 2000 favored the concept of a breakwater consisting of staggered segments.

In a subsequent Joint Permit Processing Meeting held on April 24, 2003, a majority of the resource agencies expressed a concern that the previously proposed mitigation would not address the loss of intertidal wetlands. On May 30, 2003, a plan to enhance up to 50 acres of degraded wetlands composed primarily of *Phragmites* was agreed to by the District, DNREC, U.S. Fish and Wildlife Service and the National Marine Fisheries Service (See Figure 5). The Corps will enhance a minimum of 10 acres with the potential for further enhancement if funding is authorized. This site is located on land owned by the District between the Delaware River and the Reedy Point North Confined Disposal Area.

To avoid disturbance to the heronry, no work will be done between 15 February and 1 September.

5.12 Irreversible and Irretrievable Commitments of Resources

The no action alternative does not involve a commitment of resources. The restoration alternative would involve the utilization of time and fossil fuels which are irreversible and irretrievable. Impacts to the 1.72 acres of intertidal habitat would be irreversible, but would be restored by the restoration/creation of 1.72 acres of similar habitat. DNREC, Parks and Recreation, and the Corps will implement a mutually agreeable plan of action to compensate for the additional 1.72 acres of impacted habitat.

6.0 Coordination.

a. On March 11, 2003, a meeting was held on Pea Patch Island to discuss the proposed erosion control plan. The following agencies were represented:

U.S. Army Corps of Engineers
Delaware State Historic Preservation Office (SHPO)
Delaware Natural Heritage Program
Delaware Coastal Management Program
Delaware Parks and Recreation
Delaware Wetlands and Sub-aqueous Lands Section
U.S. Fish and Wildlife Service
S.T. Hudson Engineers

The following items were discussed:

- a. Determine extent of Federal property with a survey.
- b. Minimize impacts to wetland fringe area along eastern shoreline.
- c. Minimize impacts to remnant 19th century stone wall, visible among riprap and maintain visual exposure if possible. Plans will be developed to attempt this. If the wall is to be covered by riprap or otherwise impacted, it will be documented.
- d. A NEPA document will need to be completed and water quality and coastal zone authorizations will be needed.
- e. The railroad tracks are of archaeological concern and should be salvaged to the State Park if impacted by the project.
- f. The window for building the breakwater is from 1 September to 15 February to avoid impacts to herons. The earliest nesters are the great blue herons.
- g. An amendment to the MOA will need to be signed by the Corps, the SHPO, and the State Parks before construction begins, if any cultural resources are impacted.
- h. The old wharf (pier) at the north end of the project is of archeological concern. Attempts should be made to avoid impacts to the wharf if feasible. If impacts cannot be avoided, the wharf should be documented. (This structure would only be impacted if the segmented breakwater was

constructed as mitigation to protect the larger heron rookery at the north end of the island.)

b. Joint Permit Processing Meeting, April 24, 2003.

Attendees (in part):

Corps of Engineers:

John Brady

Tom Heary

Tom Groff

DNREC, Parks:

Phil Gallo

Cara Blume

DNREC, Division of Fish and Wildlife, Jeff Tinsman

DNREC, Coastal Management Program. Susan Love

DNREC, Wetlands and Subaqueous Lands Section, Laura Herr, Andrew Whitman

National Marine Fisheries Service – Tim Goodger

The District presented the North Shoreline and Heronry Mitigation plans. Permitting issues discussed at the meeting affect both projects as follows:

The North Shoreline Project as designed by Hudson, consists of adding a new layer of rap-rap on top of the existing wall and will impact approximately 1.72 acres of wetlands, further adding to the mitigation required (Total = 5.36 acres). To minimize the wetlands impact, the Corps is considering redesigning the stabilization structure to minimize its footprint within wetlands. On a subsequent trip to the island, it was suggested that the Project include enhancement of wetlands by removing existing debris washed up on the shoreline, however reduced wave action due to the proposed structure may reduce the extent of the wetlands. Review of revised design and further discussion with the regulatory agencies will be required to determine the net impact.

The agencies said that the proposed Mitigation Project can count for a part, but not for the entire mitigation required for the filling of the erosion areas already completed. It will also not count for any additional mitigation required by the North Shoreline Project. Some other mitigation opportunity, possibly offsite, will be looked at. Since it may be neither cost effective nor practical to have more than one mitigation project, the Heronry Mitigation Project may be abandoned in favor of an alternative acceptable to the regulatory agencies. The Heronry Mitigation Project was intended to mitigate the shoreline restoration already completed, and protect against the future loss of wetlands that would occur when the ongoing erosion cuts through to the tidal creek that flows out from the west side of the island. Without the Heronry Mitigation Project, the adverse impacts to the heronry will be forgone, and it is likely that many of the wetlands that exist between the heronry and the main part of the island will be lost. At JPP, it was agreed

that there would be further investigation and discussion of this matter. The Corps will continue to work with Parks and the permitting agencies to find a resolution. A meeting between the Corps, DNREC Parks and Recreation, and the regulatory agencies will be planned in the near future to further address these issues.

c. On 7 May 2003, personnel from Planning and Engineering met with personnel from Delaware Department of Natural Resources and Environmental Control, the State Historic Preservation Office and the District's cultural resource contractor on Pea Patch Island.

Attendees:

Corps:

John Brady
Adrian Kollias
Linda Skale

DNREC, Parks and Recreation, Cara Blume
State Historic Preservation Office, Alice Guerrant
Hunter Research: Damon Tvaryanas, George Cress

They reviewed the cultural resource items that needed to be recorded prior to construction and reached agreement.

d. On May 30, 2003, a plan to enhance up to about 50 acres of wetlands composed primarily of *Phragmites* was agreed to by the District, DNREC, U.S. Fish and Wildlife Service and the National Marine Fisheries Service (See Figure 5).

e. NEPA Review

This draft Environmental Assessment for the project is being coordinated with the U.S. Environmental Protection Agency Region III, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Delaware State Historic Preservation Officer, and the Delaware Department of Natural Resources and Environmental Control (DNREC), including the Division of Parks and Recreation, the Division of Soil and Water Conservation, the Division of Water Resources, and the Natural Heritage Program. A Public Notice announcing the availability of the draft Environmental Assessment was sent to all other known interested parties.

f. Permit Requests.

Pursuant to Section 401 of the Clean Water Act, a 401 Water Quality Certificate is being requested from the DNREC. In accordance with Section 307(c) of the Coastal Zone Management Act of 1972, a coastal zone consistency determination is being requested from the Coastal Zone Management Program of Delaware.

7.0 Evaluation of Section 404(b)(1) Guidelines

I. Project Description

A. Location

The project site is located on the east bank of Pea Patch Island, Fort Delaware State Park, New Castle County, Delaware (Latitude: N 39° 35' 24"; Longitude: W 75° 33' 57"). See figures 1 and 2.

B. General Description

The proposed action is to protect and restore the eroding northeast shoreline of Pea Patch Island (north of the restored seawall) (approximately 1,600 feet of shoreline) and involves stone rubble breakwater construction and wetland/mudflat filling. The new stone rubble breakwater will be constructed along the line of the original breakwater. The new breakwater will be approximately 1,600 feet long, 60 feet wide, and 14 feet high, and consist of approximately 14,500 cubic yards of rip-rap.

C. Authority and Purpose

This project is being done under the authority of Section 110 of the National Historic Preservation Act (53 FR 4727-46). Section 110(a)(2) reads as follows:

“With the advice of the Secretary and in cooperation with the State Historic Preservation Officer for the State involved, each Federal agency shall establish a program to locate, inventory, and nominate to the Secretary all properties under the agency’s ownership or control by the agency, that appear to qualify for inclusion on the National Register in accordance with the regulations promulgated under section 101(a)(2)(A). Each Federal agency shall exercise caution to assure that any such property that might qualify for inclusion is not inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate significantly.”

D. General Description of Dredged or Fill Material

The new breakwater will be approximately 1,600 feet long, 60 feet wide, and 14 feet high. The breakwater will consist of three distinct layers and sizes of stone. The core stone ranges in size from 3 inches to 7 inches. The underlayer stone ranges in weight from 60 to 120 pounds and has an average diameter of 10.5 inches. The outer layer of armor stone ranges in weight from 700 to 1200 pounds and has an average diameter of 24 inches. Approximately 14,500 cubic yards of stone will be needed (Figures 2, 3 and 4).

E. Description of the Discharge Site

1. The discharge site is located at the east bank of Pea Patch Island, Fort Delaware State Park, New Castle County, Delaware (Latitude: N 39° 35' 24"; Longitude: W 75° 33' 57"). See figure 1.
2. The discharge site is comprised of an eroding bank with approximately 1,600 feet of shoreline. The net loss of wetlands below mean high water is approximately 1.72 acres.
3. The discharge site for the stone breakwater is unconfined with placement to occur along the alignment of the former breakwater.
4. The type of habitat present at the location is estuarine intertidal habitat.
5. The project would consist of a stone rubble breakwater constructed along the line of the original wall. The breakwater would be approximately 1,650 feet long, 60 feet wide, and 14 feet high, and consist of approximately 14,500 cubic yards of rip-rap.

F. Description of Disposal Method

It is anticipated that construction of the breakwater will occur primarily from barges anchored in the Delaware River. See Section 4.5 of the EA for a more detailed description.

II. Factual Determination

A. Physical Substrate Determinations

1. The final elevation of the breakwater will be 14 feet MLW. The breakwater will require approximately 14,500 cubic yards of riprap.
2. The breakwater would be constructed using rocks.
3. The construction template would be higher than the final intended design template or profile. It is expected that compaction would be the primary processes resulting in the change to the design template.
4. Any benthic organisms, including shellfish, that occur in the 1.72 acres of intertidal habitat that will be filled will be destroyed. No commercially or recreationally valuable species were observed on site visits by District biologists.
5. Other effects would include a temporary increase in suspended sediment load during construction of the breakwater.
6. Actions taken to minimize impacts include construction of the breakwater that will decrease turbidity from future shore erosion. Also, standard construction practices to

minimize turbidity and erosion would be employed.

B. Water Circulation, Fluctuation, and Salinity Determinations

1. Water.

- a. Salinity - no effect
- b. Water chemistry - no significant effect
- c. Clarity - minor short-term increase in turbidity
- d. Color - no effect
- e. Odor - no effect
- f. Taste - no effect
- g. Dissolved gas levels - no significant effect
- h. Nutrients - minor effect
- i. Eutrophication - no effect
- j. Others as appropriate - none

2. Current patterns and circulation

a. Current patterns and flow - circulation would only be impacted by the work in the immediate vicinity of the construction area.

b. Velocity - no significant effects on tidal velocity and longshore current velocity regimes.

c. Stratification - No significant impact.

d. Hydrologic regime - the regime is estuarine. This will remain the case following construction of the project.

3. Normal water level fluctuations - the tides are semidiurnal with a mean tide range of 5.8 feet in the Delaware Bay at the project area. Construction of the project would not affect the tidal regime.

4. Salinity gradients - there should be no significant effect on the existing salinity gradients.

5. Actions that will be taken to minimize impacts - Actions taken to minimize impacts include construction of the breakwater that will decrease turbidity from future shore erosion. Also, standard construction practices to minimize turbidity and erosion would be employed.

C. Suspended Particulate/Turbidity Determinations

1. Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the area to be filled - there would be short-term elevation of suspended particulate concentrations during construction phases in the immediate vicinity of the breakwater

construction.

2. Effects (time and duration) on Chemical and Physical Properties of the Water Column

-

- a. Light Penetration - short-term, limited reductions would be expected at the construction site.
- b. Dissolved Oxygen - no significant impact.
- c. Toxic materials and organics - no contamination is expected since the contract will specify that the material used as fill will be clean.
- d. Pathogens - pathogenic organisms are not known or expected to be a problem.
- e. Aesthetics - construction activities and the initial construction template associated with the fill site would result in a minor, short-term degradation of aesthetics and a long term improvement.

3. Effects on Biota

- a. Primary production, photosynthesis - minor, short-term effects related to turbidity. Permanent removal of 1.72 acres of intertidal habitat.
- b. Suspension/filter feeders - minor, short-term effects related to suspended particulates outside the immediate deposition zone. Sessile organisms would be subject to burial if within the deposition area.
- c. Sight-feeders - minor, short-term effects related to turbidity. Loss of 1.72 acres of intertidal habitat.

4. Actions taken to minimize impacts include standard construction practices to minimize turbidity and erosion and construction of the breakwater that will decrease turbidity from future shore erosion.

D. Contaminant Determinations

The placement of the stone material for the breakwater is not expected to introduce, relocate, or increase contaminant levels at the fill site. In addition, this is assumed based on the quality of the fill material (rock) expected to be used, the area's hydrodynamic regime, and existing water quality.

E. Aquatic Ecosystem and Organism Determinations

- 1. Effects on Plankton - the effects on plankton should be minor and mostly related to light level reduction due to turbidity. Significant dissolved oxygen level reductions are not anticipated.
- 2. Effects on Benthos - Any benthic organisms, including shellfish, that occur in the 1.72 acres of intertidal habitat that will be filled will be destroyed. No commercially or recreationally valuable species were observed on site visits by District biologists.
- 3. Effects on Nekton - The project will have limited and short-term impact on finfish.

Fish are transient and mobile by nature, and will avoid the construction area. The primary impact to fisheries will be felt from the loss of benthic and epibenthic communities that will be filled. The loss of the benthos and epibenthos smothered during stone placement and fill will disrupt the food chain in the impact area (net loss of 1.72 acres). Some colonization of the stone breakwater may occur which would provide a unique hard bottom habitat to the area. Post construction, the stone breakwater would provide structure and hiding places for small fish during high tide.

DNREC, Parks and Recreation, and the Corps will implement a mutually agreeable plan of action to compensate for the additional 1.72 acres.

4. Effects on Aquatic Food Web - only a minor, short-term, localized impact on the food web is anticipated.
5. Effect on Special Aquatic Sites - The construction of the breakwater and filling behind it will result in a net loss of 1.72 acres of intertidal habitat.
6. Threatened and Endangered Species - No impacts are expected to occur to Federally listed species.

F. Disposal Site Determinations

1. Mixing Zone Determination

- a. Depth of water - 0 to 5 feet mean low water
- b. Current velocity - moderate
- c. Degree of turbulence - moderate
- d. Stratification - none
- e. Discharge vessel speed and direction - not applicable.
- f. Rate of discharge - fill material will be discharged by crane (stone).
- g. Dredged material characteristics - The material that will be used as fill will be clean and free of any deleterious material.
- h. Number of discharge actions per unit time - the discharge will be the construction of the stone breakwater, which may take up to 6 months.

2. Determination of compliance with applicable water quality standards - prior to construction, a Section 401 Water Quality Certificate and consistency determination will be obtained from the State of Delaware.

3. Potential Effects on Human Use Characteristics -

- a. Municipal and private water supply - no effect
- b. Recreational and commercial fisheries - short-term effect during construction.
- c. Water related recreation - short-term effect during construction
- d. Aesthetics - short-term effect during construction
- e. Parks, national and historic monuments, national seashores, wilderness areas,

etc. - The breakwater will restore historic Fort Delaware, which is on the National Register of Historic Places.

G. Determination of Cumulative Effects on the Aquatic Ecosystem - none anticipated.

H. Determination of Secondary Effects on the Aquatic Ecosystem - any secondary effects would be minor and of short duration.

III. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

A. No significant adaptation of the Section 404(b)(1) Guidelines were made relative to this evaluation.

B. The alternative measures considered for accomplishing the project objectives are detailed in Section 4 of this document of which this 404(b)(1) analysis is a part. As noted in Section 5.3, 1.72 acres of intertidal habitat will be filled to construct the breakwater. In addition DNREC, Division of Parks and Recreation and the Corps will implement a mutually agreeable plan of action to compensate for loss of intertidal habitat.

C. A water quality certificate will be obtained from the Delaware Department of Natural Resources and Environmental Control.

D. The breakwater will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

E. The breakwater will comply with the Endangered Species Act of 1973. Informal coordination procedures have been completed.

F. The breakwater will not violate the protective measures for any Marine Sanctuaries designated by the Marine Protection, Research, and Sanctuaries Act of 1972.

G. The breakwater will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational or commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Significant adverse effects on lifestages of aquatic life and other wildlife dependent on aquatic ecosystems; aquatic ecosystem diversity, productivity, and stability; and recreational, aesthetic, and economic values will not occur.

H. This project complies with the Guidelines. It includes all appropriate and practical measures to minimize impacts to the aquatic environment. Appropriate steps to minimize potential adverse impacts of the discharge on aquatic systems includes building the breakwater to decrease turbidity from future shore erosion. DNREC, Parks and Recreation, and the Corps will implement a mutually agreeable plan of action to compensate for the additional 1.72 acres of intertidal habitat.

I. On the basis of the guidelines, the placement site for the fill material is specified as

complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem.

8.0 Clean Air Act Statement Of Conformity

CLEAN AIR ACT STATEMENT OF CONFORMITY FORT DELAWARE STATE PARK EROSION CONTROL PROJECT PEA PATCH ISLAND OFF OF DELAWARE CITY, NEW CASTLE COUNTY, DELAWARE

I have determined that the selected plan conforms to the applicable State Implementation Plan (SIP). The Environmental Protection Agency had no adverse comments under their Clean Air Act authority. No comments from the air quality management district were received during coordination of the draft environmental assessment. The selected plan would comply with Section 176 (c)(1) of the Clean Air Act amendments of 1990.

The total estimated emissions that would result from construction of the Fort Delaware State Park Erosion Control Project (North Shoreline) are 4.41 tons of NO_x and 0.15 tons of VOCs. An additional 0.025 tons of NO_x and 0.022 tons of VOC are estimated to be emitted from employees' vehicles commuting to and from work. These emissions are below the General Conformity trigger levels of 25 tons per year for each pollutant. General Conformity under the Clean Air Act, Section 176 has been evaluated for the project according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this project because the total direct and indirect emissions from the project are below the conformity threshold values established at 40 CFR 93.153 (b) for ozone (NO_x and VOCs) in a Severe Non-attainment Area (25 tons of each pollutant per year). The project is not considered regionally significant under 40 CFR 93.153 (i).

Date

Thomas C. Chapman, P.E.
Lieutenant Colonel, Corps of Engineers
District Engineer

9.0 References

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S.T. Hudson Engineers, Inc. 1998. *Technical Specification for Breakwater, Pea Patch Island, Delaware*. Prepared for State of Delaware, Department of Natural Resources and Environmental Control, Division of Parks and Recreation. April 17, 1998.

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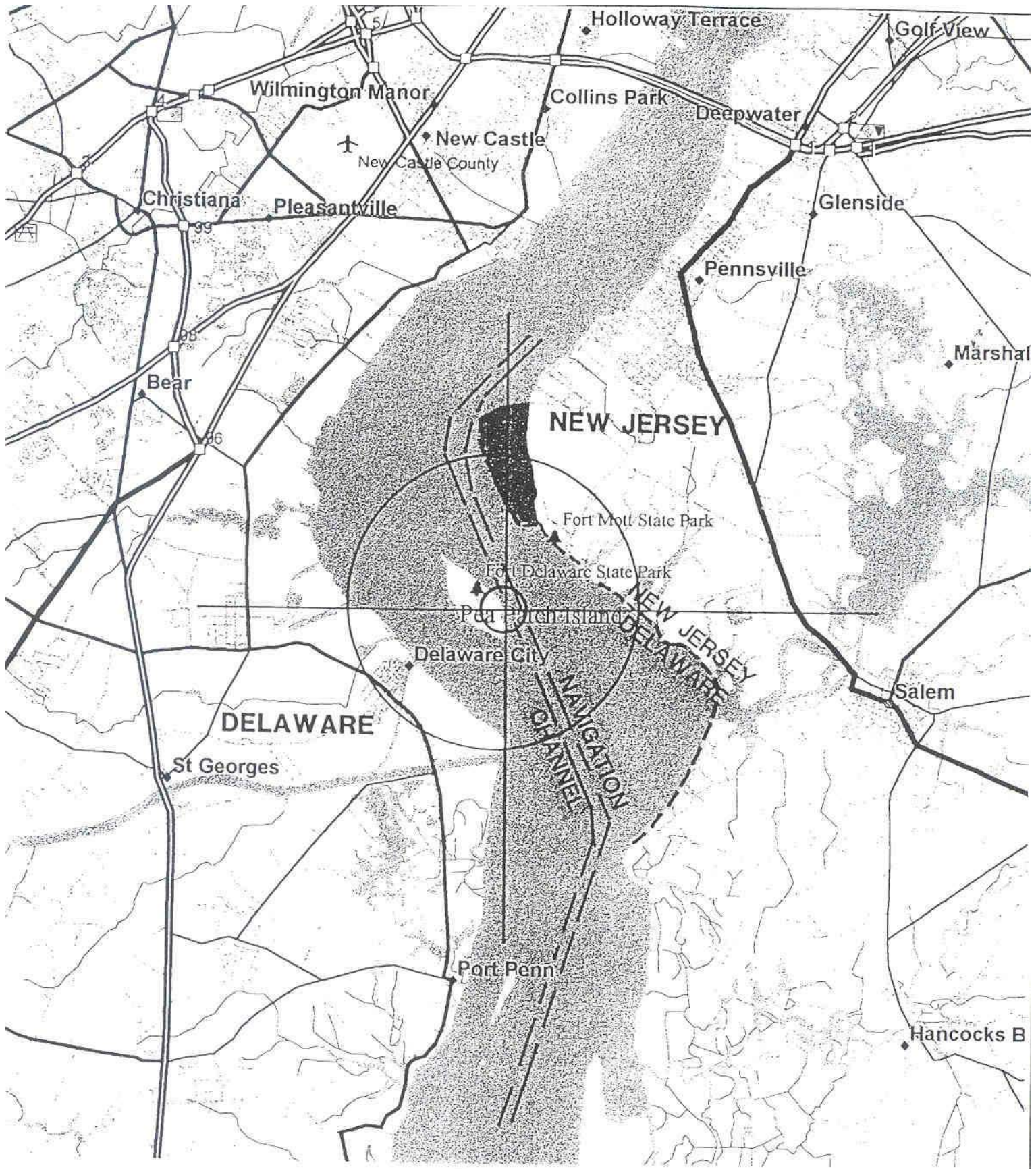
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APPENDIX A

FIGURES



NOTE: FINAL DESIGN REQUIRED FOR CONSTRUCTION

S.T. HUDSON ENGINEERS, INC.
 PROFESSIONAL ENGINEERS & CONSULTANTS

 800 Hudson Square
 P.O. Box 9106
 Camden, N.J. 08101
 Fax No. 609-342-6323 609-342-6600

DESIGNED	DRAWN P.J. McDERMOTT	U.S. ARMY ENGINEER DISTRICT, PHILADELPHIA CORPS OF ENGINEERS PHILADELPHIA, PENNSYLVANIA	
SUBMITTED		 PEA PATCH ISLAND, FORT DELAWARE STATE PARK NEW CASTLE COUNTY, DELAWARE BANK STABILIZATION AND RESTORATION	
CHIEF, C & S SECTION			
REVIEWED			
S & OH MANAGER			
RECOMMENDED			
CHIEF, DESIGN BRANCH		PROJECT SITE	
APPROVED			
CHIEF, ENGINEERING DIVISION		SIZE A	DRAWING NO.
FILE NAME:		SCALE: NONE	FIGURE 1
DATE: 25 AUGUST 1998			

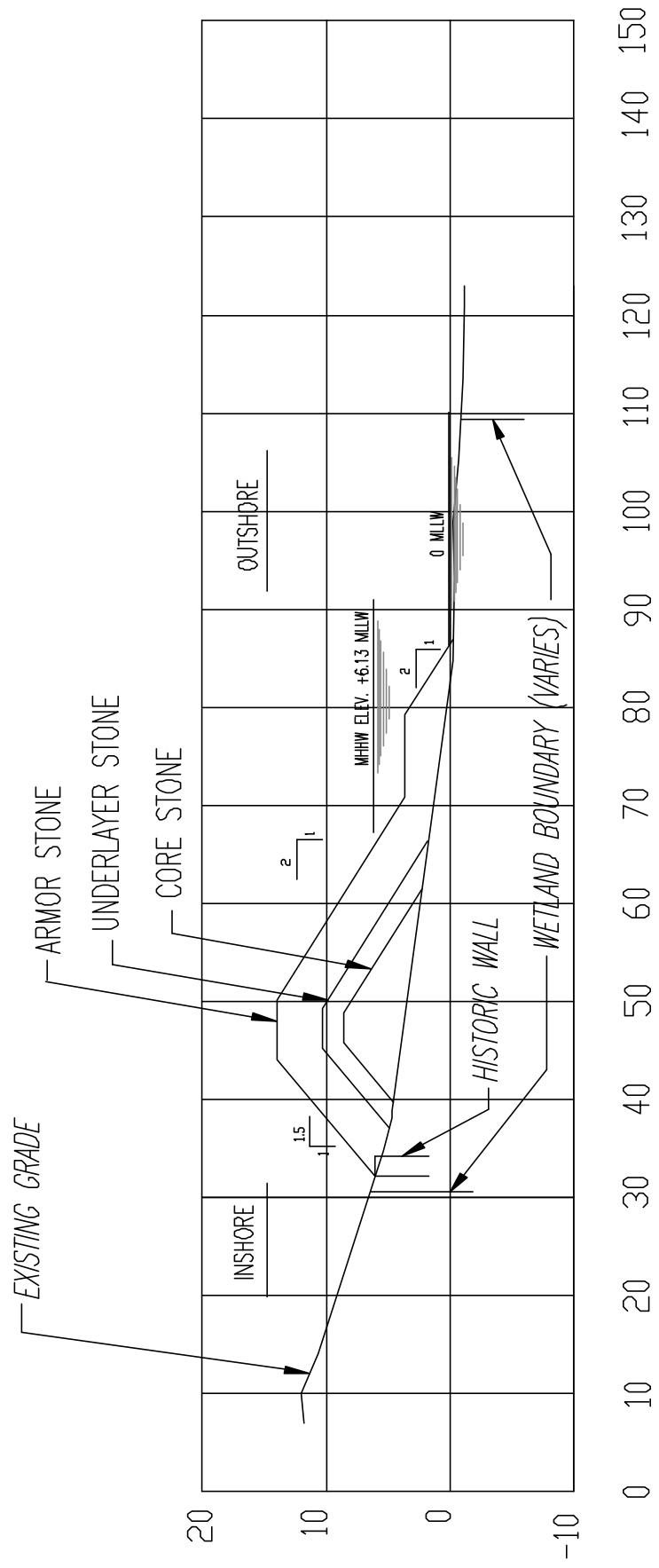


Figure 2. Stone Breakwater at 2:1 slope (Typical Cross-Section).

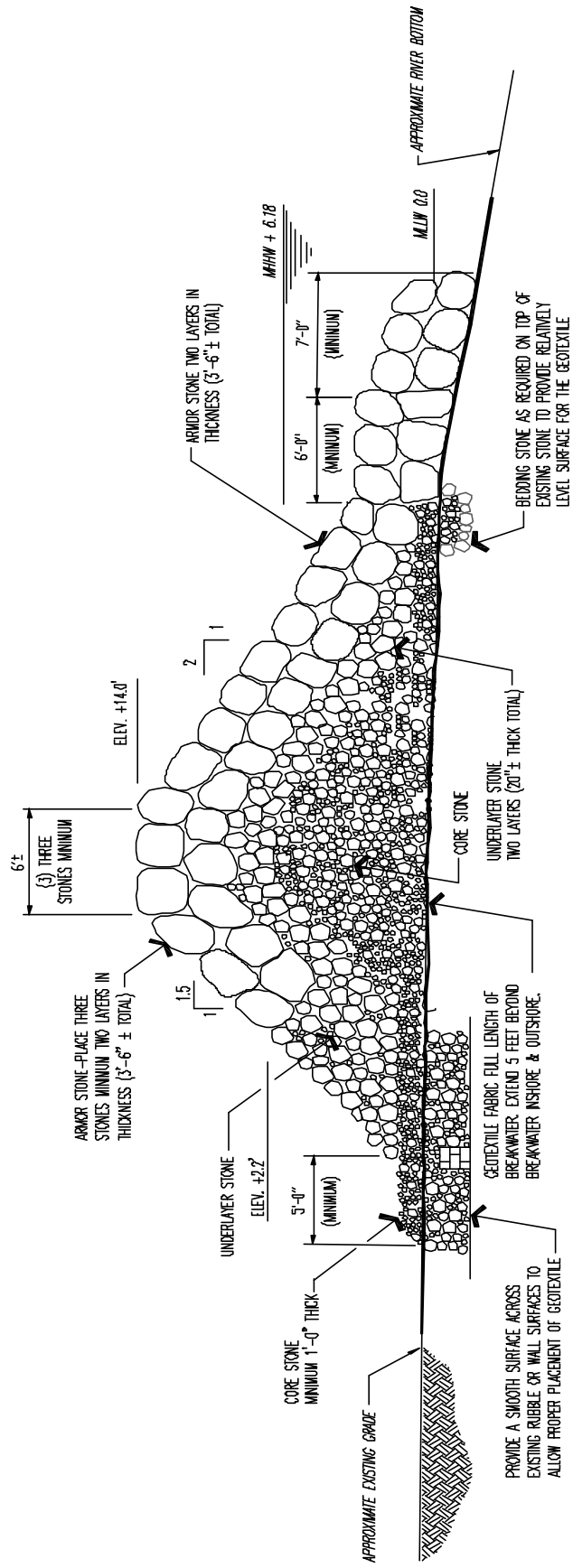


Figure 3. Typical Section of Breakwater (2:1 Slope).

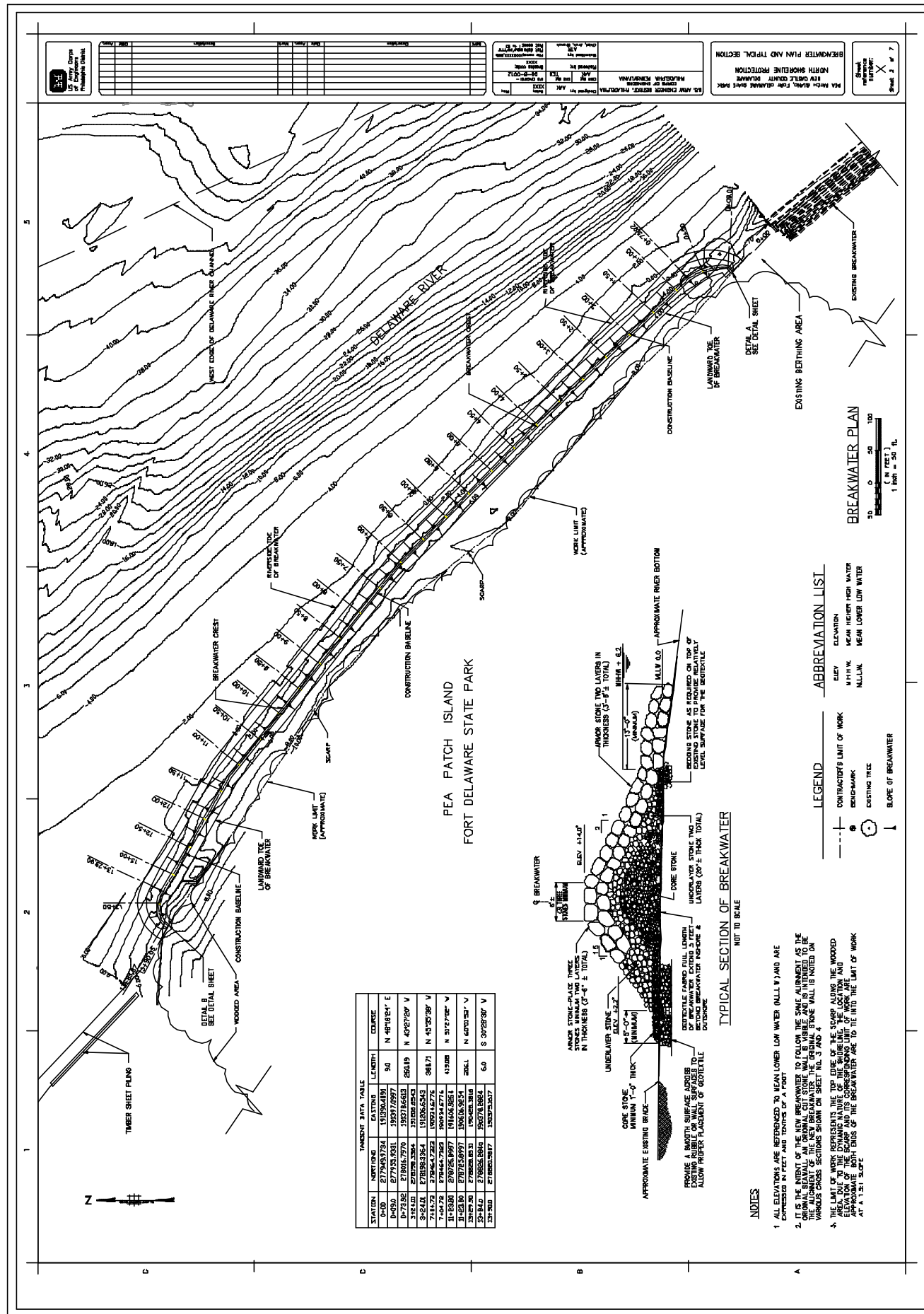
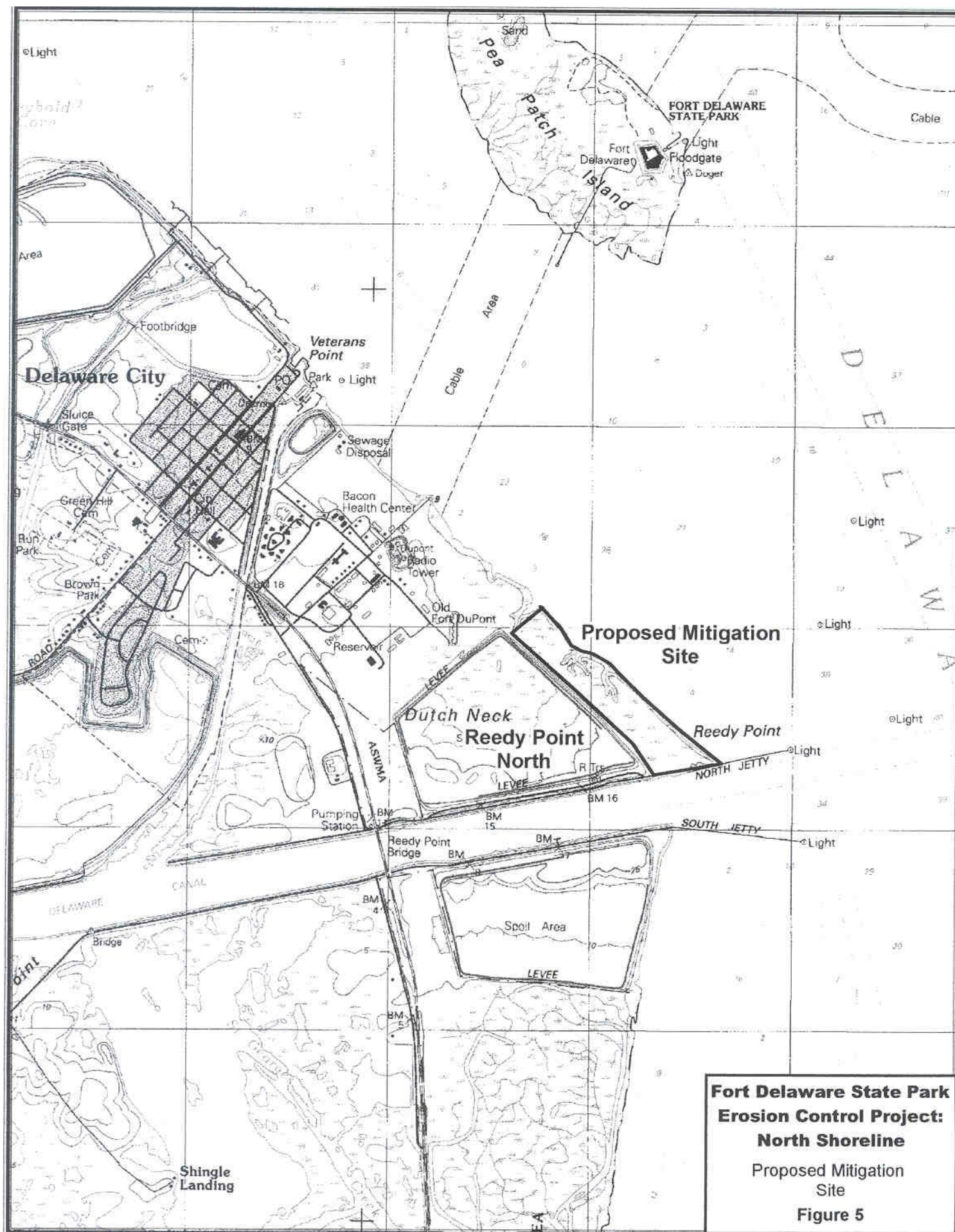


Figure 4. Breakwater Plan and Typical Section



**Fort Delaware State Park
Erosion Control Project:
North Shoreline**
Proposed Mitigation
Site
Figure 5

APPENDIX B

REQUESTS FOR WATER QUALITY CERTIFICATION AND COASTAL ZONE DETERMINATION

Environmental Resources Branch

Mr. William Moyer
Wetlands and Subaqueous Lands Section
Division of Water Resources
Delaware Department of Natural Resources & Environmental Control
89 Kings Highway, P.O. Box 1401
Dover, Delaware 19903

Dear Mr. Moyer:

The purpose of this letter is to request Section 401 Water Quality Certification for the plan as proposed in the document entitled: *Supplemental Environmental Assessment, Fort Delaware State Park Erosion Control Project, Pea Patch Island Off of Delaware City, New Castle County, Delaware*. This report, including a *Joint Permit Application Form For Subaqueous Lands, Wetlands, and Marina Projects* in Appendix B, is attached.

The United States Army Corps of Engineers has evaluated the construction of a breakwater to restore a portion of historic Fort Delaware State Park that has been impacted by erosion, and to prevent further erosion to this area on Pea Patch Island, New Castle County, Delaware.

The proposed action is to protect and restore the eroding north wall of Pea Patch Island (approximately 1,600 feet of shoreline) and involves stone rubble breakwater construction. The new stone rubble breakwater will be constructed along the line of the original breakwater. The new breakwater will be approximately 1,600 feet long, 60 feet wide, and 14 feet high, and consist of approximately 14,500 cubic yards of rip-rap. The District is also presenting a conceptual plan to mitigate for all wetland impacts (approximately 5.36 acres) sustained by the erosion control project on Pea Patch Island. The Corps will enhance a minimum of 10 acres with the potential for further enhancement if funding is authorized. This site is located on land owned by the District between the Delaware River and the Reedy Point North Confined Disposal Area.

Please review the enclosed report and provide Section 401 Water Quality Certification by July 30, 2000. Extra copies of the report are available upon request. If you have any questions regarding this project, please contact John Brady of the Environmental Resources Branch at (215) 656-6554.

Sincerely,

Minas M. Arabatzis
Chief, Planning Division

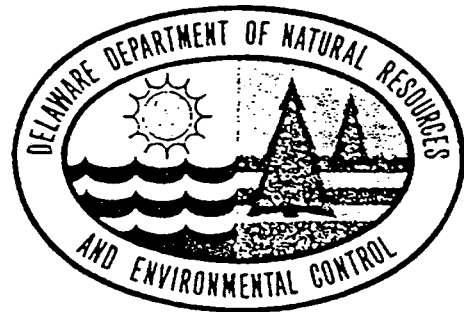
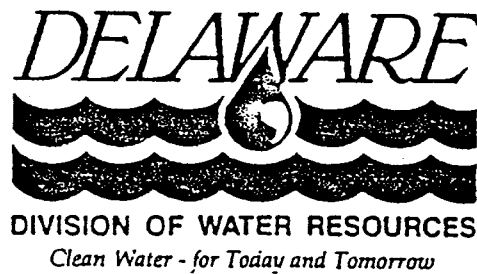
Enclosure

MFR: Coordinated with CENAP-EN-MM (Penrose) and CENAP-OP (Groff). Letter to DNREC requesting 401 WQC for the Fort Delaware State Park Erosion Control Project.

JOINT APPLICATION FORM

For Subaqueous Lands, Wetlands,
and Marina Projects

State of Delaware
Department of Natural Resources
and Environmental Control
Division of Water Resources



APPLICATION FOR APPROVAL OF A
SUBAQUEOUS LANDS, MARINA,
AND/OR WETLANDS PROJECTS

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

- * Complete each section of this application as thoroughly and accurately as possible. Incomplete or inaccurate applications will be returned.
- * Depending upon the nature of the project, some appendices now require professional expertise to be properly completed. A consultants list is available by calling (302) 739-4691.
- * Proof of ownership or permitted land use agreement is mandatory and must be submitted at time of application.
- * While completing this application, please refer to the definitions and explanations provided in the Joint Permit Application Form Reference Guide.
- * All applications must be accompanied by plan drawings which show the location and design details of the proposed work. For specific requirements and typical drawings, refer to the explanation section and typical plans section of the Joint Application Form Reference Guide. 8 1/2" x 11" black and white drawings (to scale) are required for every application. Full construction plans may also be submitted for additional clarification on major projects.
- * Fee schedules are provided as an insert to this application. Application fees are non-refundable regardless of the permit decision or application status.
- * After completing the basic information section, complete the appropriate "type of project" appendix for your project. Please refer to the Joint Application Form Reference Guide if you need help.
- * All applications must be completed in ink. Submit three (3) complete copies of the application and drawings to :

Department of Natural Resources and
Environmental Control
Division of Water Resources
Wetlands and Subaqueous
Lands Section
89 Kings Highway, P. O. Box 1401
Dover, DE 19903
- * No construction may begin at the project site before written approval has been received for this work.

If you have any questions about this application, please call (302) 739-4691.

BASIC APPLICATION FORM

ATTACH ADDITIONAL 8 1/2" X 11" SHEETS OF PAPER AS
NEEDED

1. Applicant's (Property Owner) name and complete address:
U.S. Army Corps of Engineers
Philadelphia District
Wanamaker Building , 100 Penn Sq. East
Phila., PA. 19107-3390
Telephone Number
Home (): _____
Work (215): 656-6554
2. Name of Leaseholder (if applicable) of land where project is contemplated and complete address: _____

Telephone Number
Home (): _____
Work (): _____
3. Authorized agent's name and complete address (if applicable): John T. Brady
(same as above)
(Complete agent authorization section at the bottom of page 8)
Telephone Number
Home (215): 656-6554
Work (): _____
4. Is this project
____ New? x Repair/Replacement?
____ Both? If "Both", please explain:
____ Supplemental Approval for an existing lease or permit?
5. Provide a brief description of the project: Shoreline stabilization.

A. _____ Dredging Total Estimated Volume: _____ cu. yds.	D. _____ Dock(s) Total Number: _____
B. <u>x</u> Filling Total Volume: 14,500 cu. yds. stone	E. _____ Pier(s)/Walkways Total Number: _____
C. <u>x</u> Shore Erosion Control Total Length: <u>1,600</u> ft.	F. <u>x</u> Other Total Dimensions: 2.2 acres fill intertidal area.

6. Primary purpose of the project:

<input checked="" type="checkbox"/> Shore Erosion Control	<input type="checkbox"/> Road
<input type="checkbox"/> Utility Installation	<input type="checkbox"/> Improve Navigable Access
<input type="checkbox"/> Create Waterfowl Habitat	<input type="checkbox"/> Improve Fish Habitat
<input type="checkbox"/> Temporary Construction	<input type="checkbox"/> Stream Channelization
<input type="checkbox"/> Beach Nourishment/Fill	<input checked="" type="checkbox"/> Maintenance/Repair
<input type="checkbox"/> Residential Commercial	<input type="checkbox"/> Small Pond
<input type="checkbox"/> Development	<input type="checkbox"/> Marina
<input type="checkbox"/> Erosion/Sediment Control	<input type="checkbox"/> Bridge
<input type="checkbox"/> Stormwater Management	<input type="checkbox"/> Vessel Berthing/Launching
<input type="checkbox"/> Fill	<input checked="" type="checkbox"/> Other (<u>Protect historic</u>
<input type="checkbox"/> Culvert	<u>resources</u>
<input type="checkbox"/> Dam	

7. Have you discussed this project with any representative of Local, State, or Federal regulatory agency? ☒ Yes ☐ No

If yes, complete the information below.

Name of Representatives: Andrew Whitman, Susan Love, Laura Herr, William Moyer, Cara Blume, Tim Goodger, George Ruddy, Alice Guerrant

Name of Agency: DNREC, NMFS, USFWS, SHPO

Date: March 11, 2003, April 24, 2003, May 30, 2003

8. Have you applied for, or obtained a permit from any Local, State, or Federal agency for any portion of this project described in this application?

☐ Yes ☒ No

If yes, provide the following:

Agency: _____

Type of Action/Permit: _____

ID No: _____

Application/Issue Date: _____

9. Project Location: Fort Delaware State Park, Pea Patch Island

Site address of Location: _____

County/City: New Castle County, off Delaware City

Directions from nearest intersection of two state roads: _____

Name of the waterbody at the project location: Delaware River

Is it a tributary of any other water body? ☒ Yes ☐ No

If yes, which waterbody? Atlantic Ocean

The waterbody at the project location is: (check one on line A & one on line B)

A. ☒ Natural ☐ Man-made ☐ Uncertain

B. ☒ Tidal ☐ Non-tidal ☐ Uncertain

10. Current land use: ☐ Agriculture ☒ Marsh/Swamp
☐ Meadow ☐ Wooded ☐ Developed
- Present zoning is: ☐ Agriculture ☐ Commercial
☐ Residential ☒ Other
11. a. List the name and complete address of the owners of the contiguous neighboring lands on all sides of the property. (Attach sheets as needed).
State of Delaware, DNREC
Division of Parks and Recreation
89 Kings Highway, Dover, DE 19901
- b. *For marina projects or projects that include activities or construction in wetlands*, list the name and complete address of the owners, as listed with the County Board of Assessment, of neighboring lands within 1,000 feet of the project (including those across the waterway if within the 1,000 foot radius) and any claimants of such ownership rights that are known to the applicant, with their last known addresses. Motiva, 2000 Wrangle Hill Rd., Delaware City, DE 19706;
U.S. Army Corps of Engineers, Wanamaker Bldg., 100 Penn Square East, Philadelphia, PA 19107
12. Will any public benefit be derived from the project? ☒ Yes ☐ No ☐ Uncertain If yes, explain below: Project will restore and protect a portion of Fort Delaware State Park, including historic Fort Delaware.
13. Has any work commenced or has any portion of the project for which you are seeking a permit been completed? ☐ Yes ☒ No If yes, give details below. State when work was completed and who performed the work. Please indicate on attached drawings what is proposed.
14. Proposed Start Date: September 2, 2003
15. Contractor's Name and Complete Address: To be determined
- Telephone Number: _____

**PLEASE COMPLETE AND ATTACH ALL
APPROPRIATE DRAWINGS AND APPENDICES TO THIS
SECTION. INCLUDE A COPY OF THE PROPERTY DEED AND
SURVEY TO SHOW ALL PROPERTY BOUNDARIES AND
DIMENSIONS.**

APPLICANT SIGNATURE &/OR AGENT AUTHORIZATION

- * **All applicants must sign this page. Complete the Agent Authorization Section only if applicable.**

I certify that the information on this form and the attached plans is true and accurate to the best of my knowledge.

I understand that DNREC may request information in addition to that set forth herein and may be deemed appropriate in considering this application.

I grant permission to the authorized DNREC representative(s) to enter upon the premises for inspection purposes during working hours.

I will abide by the conditions of this approval if issued.

Applicant Signature

Date

Applicant Name (Printed/Typed) _ Minas M. Arabatzis _

Agent Authorization Section

- * **If you elect to complete this section, all future correspondence may be signed by the duly authorized agent. In addition, the agent will become the primary point of contact for all correspondence from the Department.**

I MINAS M. ARABATZIS, hereby designate and authorize

Name of applicant

John T. Brady

Name of Agent

to act on my behalf in the processing of this application and to furnish any information that is requested.

Applicant Signature

Date

Agent Signature

Date

TYPE OF PROJECT

List of Appendices

Please complete the Basic Application Form (pages 4 through 8) for all projects. Please check below only the appendices which apply to your project, complete the appropriate appendices and attach them to the Basic Application Form. (Please see definitions and explanations section of the Joint Application Form Reference Guide for further help.)

Applications must have the following applicable appendix completed upon submittal. Return only those appendices which apply to your project. Incomplete applications will be returned.

- | | |
|--|--|
| A. <input type="checkbox"/> Boat Docking Facilities (1-4 slips) | L. <input type="checkbox"/> Construction in State Wetlands (Type I) |
| B. <input type="checkbox"/> Boat Ramps | M. <input checked="" type="checkbox"/> Construction in State Wetlands (Type II) |
| C. <input type="checkbox"/> Road Crossings | N. <input type="checkbox"/> Preliminary Marina Screening Checklist (See * below) |
| D. <input type="checkbox"/> Channel Modifications or Impoundment Structures (Dams) | O. <input type="checkbox"/> Marina (See * below) |
| E. <input type="checkbox"/> Utility Crossings | P. <input type="checkbox"/> Stormwater Management |
| F. <input type="checkbox"/> Intake or Outfall Structures | Q. <input type="checkbox"/> Ponds and Impoundments (Other than for Stormwater Management) |
| G. <input type="checkbox"/> Bulkheads | R. <input type="checkbox"/> Dredging/Maintenance
<input type="checkbox"/> Hydraulic <input type="checkbox"/> Mechanical |
| H. <input type="checkbox"/> Fill | S. <input type="checkbox"/> New Dredging
<input type="checkbox"/> Hydraulic <input type="checkbox"/> Mechanical |
| I. <input checked="" type="checkbox"/> Rip-Rap | |
| J. <input type="checkbox"/> Vegetative Stabilization | |
| K. <input checked="" type="checkbox"/> Groins, Jetties, or Breakwaters | |

*Please see following section on Marinas for a description of the requirements.

Reminder: After completing the basic application and the appendices which apply to this project, turn to the sample drawings in the Joint Application Form Reference Guide and prepare your application drawings.

APPLICANT BACKGROUND INFORMATION

Pursuant to 7 Del. C., Chapter 79, the following information must be submitted along with any commercial subaqueous lands permit application. "Commercial" is defined as any activity undertaken for profit for which a fee will be charged, directly or indirectly, or which results in the generation of revenue. Please use the N/A abbreviation for any items that are not applicable to your application.

PROVIDING ALL THE INFORMATION REQUESTED IN THIS FORM SATISFIES THE REQUIREMENTS OF 7 DEL. C., CH. 79 UNLESS THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL OR THE DEPARTMENT OF JUSTICE DETERMINES THAT ADDITIONAL SUBMISSIONS ARE NECESSARY. FAILURE TO PROVIDE THE INFORMATION REQUESTED OR PROVIDING ERRONEOUS INFORMATION IS GROUNDS FOR DENYING OR REVOKING AN ENVIRONMENTAL PERMIT, AND FOR CIVIL OR CRIMINAL PENALTIES.

1. * Attach a complete list of all current members of the Board of Directors, all current corporate officers, all persons owning more than 20 percent of the applicant's stock or other resources, all subsidiary companies, all parent companies, all companies with which the applicant's company shares two or more members of the Board of Directors.
2. * Attach a description of any felony or other criminal conviction of any person or company identified in response to Question 1 where the conviction resulted in a fine greater than \$1,000 or a sentence longer than seven days, regardless of whether any portion of such fine or sentence was suspended.
3. Have any of the following been issued to any person or entity specified in response to Question Number 1 or any violation of any environmental statute, regulation, permit, license, approval, or order, regardless of the state in which it occurred, during the five years prior to the date of the application:

Notice of Violation	(yes or no) <u>No</u>
Administrative Penalties	(yes or no) <u>No</u>
Criminal Citation	(yes or no) <u>No</u>
Arrests	(yes or no) <u>No</u>
Convictions	(yes or no) <u>No</u>
Criminal Penalties	(yes or no) <u>No</u>

4. If you answered "Yes" to any of the items in Question 3, attach a description of the incidents or events leading to the issuance of each enforcement action, the disposition of each action, and any actions that have been taken to correct the violations that led to such enforcement action.
5. * Attach copies of any and all settlements of the environmental claims associated with actions identified in response to Question 3 above, whether or not such settlements were based on agreements where the applicant did not admit liability for the action.

I do hereby swear that I have read the above questions and have provided all of the information requested and that all of the information provided is true and accurate.

Date

Signature - Applicant or Corporate Agent

Name: Minas M. Arabatzis

Company Name: US Army Corps of Engineers

Address: Wanamaker Building, 100 Penn Square
East, Philadelphia, PA 19197-3390

Phone: 215-656-6540

* NOTE: The applicant may claim that some or all of the information presented in response to Questions, 1, 2, and 5 is confidential if such information is not already available to the public. An applicant wishing to make such a claim should write, preferably in red ink "claimed confidential information" at each point in the response where such confidentiality is claimed, and provide an explanation of why the release of such information would constitute an invasion of personal privacy or would seriously affect the applicant's business or competitive situation.

APPENDIX I RIP-RAP

- * Please make sure answers to all of the questions in this appendix correspond to information on the application drawings.
 - * See Joint Application Form Reference Guide - How to Calculate Square Feet, Cubic Feet, and Cubic Yards.
 - * To calculate average number of cubic yards of rip-rap per running foot of shoreline: Divide the average length of shoreline structure into the total cubic yards.
1. Will the project be considered new construction or repair and replacement of an existing rip-rap structure? x New Construction Repair and Replacement
If repair/replacement, photographs must be submitted of entire project length.
 2. What will be the overall length of the rip-rap structure? 1,600 ft.
 3. What will be the average number of cubic yards of rip-rap used?
Per running foot of shoreline? 9.1 cubic yards
Total? 14,500 cubic yards
 4. How many feet will the rip-rap structure be placed channelward of the:
 - A. Tidal waters: mean high water line? 60 ft.
mean low water line? 0 ft.
 - B. Non-tidal waters: ordinary high water line? N/A ft.
 5. How much of the rip-rap structure will be located:
 - A. channelward of mean high water? 95,832 sq. ft.
 - B. on vegetated wetlands? 47,916 sq. ft.
 6. What type of material(s) will be used for construction of the rip-rap structure (e.g. quarry stone, broken concrete, cinder blocks, etc.)? The breakwater will consist of three distinct layers and sizes of stone. The core stone ranges in size from 3 inches to 7 inches. The underlayer stone ranges in weight from 60 to 120 pounds and has an average diameter of 10.5 inches. The outer layer of armor stone ranges in weight from 700 to 1200 pounds and has an average diameter of 24 inches.
 7. Will the rip-rap structure be backfilled? Yes x No If your answer is "Yes", complete Appendix H.
 8. Will filter cloth be used behind the rip-rap structure? x Yes No

(APPENDIX I, CONTINUED)

9. What will the average weight of the:
- A. armor (Larger size rip-rap) material? 900 pounds
- B. core (smaller size rip-rap) material 50 to 100 pounds
(See sample drawing in Joint Application Form Reference Guide for illustration of armor and core material.)
10. What is the average slope of the existing bank? Inshore along bank 0 to 2; Outshore along breakwater – flat.
11. What will the average slope of the rip-rap structure?
Inside is 1.5 to 1; outside is 2 to 1.
Slope = _____ ft. (Run Horizontal distance):
_____ ft. (Rise-Vertical distance):

HOW TO CALCULATE SLOPE

FORMULA: $\text{SLOPE} = \frac{\text{RUN (Horizontal distance or Base Width)}}{\text{RISE (Vertical distance or Height)}}$

PROBLEM: Stabilize an eroding bank by filling an area 4 feet high and 8 feet wide with quarry stone rip-rap.

CALCULATION: $\text{SLOPE} = \frac{\text{RUN}}{\text{RISE}}$ therefore,

$$\text{SLOPE} = \frac{8}{4} \text{ or,}$$

$$\text{SLOPE} = \frac{2}{1} \text{ OR,}$$

$$\text{SLOPE} = 2\text{H:1V}$$

APPENDIX K

JETTIES, GROINS, OR BREAKWATERS

* Please make sure answers to all of the questions in this appendix correspond to information on the application drawings.

1. What type of material(s) will be used for the construction of the structure(s) (e.g. quarry stone, timber, rock gabions, sandbags, etc.)? Quarry stone.
2. How many feet will the structure(s) be placed channelward of the:
 - A. Tidal Waters: mean high water line? 60 ft.
mean low water line? 0 ft.
 - B. Non-tidal waters: ordinary high water line? N/A ft.
3. How much of your project will be located:
 - A. channelward of mean high water? 95,832 sq. ft.
 - B. on vegetated wetlands? 47,916 sq. ft.
4. What will be the distance of separation between individual structures? There will be a 70 ft gap from the existing breakwater that will be used as a berthing area.
5. Are there similar structures in the vicinity of the project? x Yes No If your answer is "Yes", describe the type and location(s) of the structures. Breakwaters along the shoreline to the south.
6. The structure(s) will be of: (check one)
 - A. Low-Profile design
 - B. x Continuous height
7. How many feet will the structure(s) be placed landward of the:
 - A. tidal waters: mean high water line? 0 ft.
mean low water line? Varies ft. See Drawing
 - B. non-tidal waters: ordinary high water line? N/A ft.
8. Will the area in the vicinity of the structure(s) be artificially nourished?
 Yes x No If the answer is "Yes", complete Appendix H.
9. Approximately how many feet of shoreline have you lost over the last year?
About 80 ft. over 40 years (width) 1600 ft. (length)
10. Will the landward end(s) of the structure be protected from out flanking with rip-rap? x Yes No If our answer is "Yes", complete Appendix I.

APPENDIX M

CONSTRUCTION IN STATE WETLANDS (TYPE II)

* Please make sure that all answers in this appendix correspond to information on the application drawings.

* See Joint Application Form Reference Guide - How to Calculate Square Feet, Cubic Feet, and Cubic Yards.

* TYPE II Permits (Full Procedure) are required for:

- A. Projects involving more than one (1) acre of wetlands.
- B. Projects involving the building of structures.
- C. The construction and maintenance of lines for the transmission of electrical energy that require artificially solidified bases, and/or the construction of permanent access roads or other fixed works related thereto, which alter the flow of the tide or the natural contour of the wetlands.
- D. The construction and maintenance of water, gas or petroleum lines.

1. Project description and explanation of need. See report.

2. What is area of impact for each activity in state wetlands?

Filling	<u>95,832</u>	sq. ft.
Dumping	<u>N/A</u>	sq. ft.
Excavation	<u>N/A</u>	sq. ft.

3. What is volume of fill or excavated material involved in this project?

Fill	<u>14,500</u>	cubic yards
Excavation	<u>N/A</u>	cubic yards

(APPENDIX M, CONTINUED)

ENVIRONMENTAL SUMMARY - PLEASE SUBMIT AN EVALUATION OF IMPACT OF THE PROPOSED ACTIVITY ON THE FOLLOWING (ATTACH ADDITIONAL SHEETS):

4. State reasons that structures cannot feasibly be located on lands other than wetlands.
5. Detail temporary and permanent changes which would be caused by the proposed project and the impact of these changes on the project area and adjacent areas.
6. Describe alternatives to the proposed action which would reduce or avoid environmental damage.
7. Describe all measures to be taken during and after the completion of the proposed project to reduce detrimental effects.
8. Describe all permanent environmental impacts which cannot be avoided.
9. Submit detailed evaluation of impact of the proposed project on the following:

A. Value of tidal ebb and flow

- | | |
|---------|--|
| species | <ol style="list-style-type: none">1. Production Value: carrying organic matter to adjacent estuaries and coastal waters which serve as breeding areas for certain animal (especially fish and shellfish).2. Value as a natural protective system of absorption of storm wave energy, flood waters, and heavy rainfall, thereby decreasing flood and erosion damage.3. The prevention of silting in certain harbors and inlets thereby reducing dredging.4. Removal and recycling of inorganic nutrients.5. Effect on the estuarine waters. |
|---------|--|

B. Habitat Value

1. Habitat for resident species of wildlife including furbearers, invertebrates, finfish.
2. Habitat for migratory wildlife species including waterfowl, wading birds, shorebirds, passerines, finfish, shrimp.
3. Rearing area, nesting area, breeding grounds for various species.
4. Habitat for rare or endangered plants.
5. Presence of plants or animals known to be rare generally, or unique to the particular location.
6. Presence of plants or animals near the limits of their territorial range.
7. Presence of unique geological or wetland features.

(APPENDIX M, CONTINUED)

C. Aesthetic Effect - Consideration of the aesthetic effect may include:

- 1. Presence of plants or animals of a high visual quality.**
- 2. The presence of an associated water body.**
- 3. Wetland type of topographic diversity.**

D. Impact of Supporting Facilities

The supporting facilities to be considered include any public or private construction, whether or not the construction occurs in the wetlands, which would be required for construction or operation of the proposed wetlands activity, such as roads, sewage disposal facilities, electric lines, water supply systems, and schools. Effects shall be separately determined for the lands neighboring such facilities.

E. Effect on Neighboring Land Uses

- 1. The effects of the proposed wetland activity on neighboring land use are to be considered whether or not the neighboring lands are wetlands.**
- 2. The environmental, aesthetic and economic effects of the proposed wetlands activity on land uses neighboring the lands on which supporting facilities will be located may be considered.**

F. Federal, State, Regional, County and Municipal Comprehensive Plans.

Compliance of the proposed activities with the plans of the jurisdiction in which it is proposed to take place, and its impact on the plans of other affected jurisdictions.

G. Economic Impact

Economic Impact shall include a short and long-term evaluation of the following factors to the extent the effect is directly attributable to the proposed activity:

- 1. Jobs created or lost and the net income effect of jobs.**
- 2. Increases in revenues to or increases in expenditure by State, County and local governments (e.g., increased taxes from an increased tax base and increased expenditure for maintaining supporting facilities).**
- 3. Increases or decreases in the value attributable to the wetland as a source of nutrients to finfish, crustacea and shellfish and as habitats such species or other flora or fauna of significant actual or potential economic value.**
- 4. Increases or decreases in the value of the land as a recreational area.**

of

(APPENDIX M, CONTINUED)

5. **Increases or decreases in the cost of flood control or expected flood damage which might be caused by the effect of the activity on the natural capacity of the wetland to reduce flood damage.**
6. **Increases or decreases the costs of maintaining navigable harbors and waterways which would result from altering the capacity of the wetlands to absorb silt.**
7. **The net economic effect, both public and private, or any contemplated supporting facilities.**
8. **The net economic effect, both public and private, of the proposed activity on neighboring land uses.**

ENVIRONMENTAL SUMMARY:

4. State reasons that structures cannot feasibly be located on lands other than wetlands.

The purpose of this project is to prevent further erosion to the historic configuration of Pea Patch Island and protect historic artifacts. Moving the structure onto uplands would leave the original stone wall and timber grillage exposed to further erosion and destruction. The segmented breakwater is expected to protect the remaining wetlands from erosion and provide a protected area where the remaining wetlands will improve in value. See Sections 1.0 and 7.0 (III, B) of the Supplemental Environmental Assessment (SEA).

5. Detail temporary and permanent changes which would be caused by the proposed project and the impact of these changes on the project area and adjacent areas. See Section 5.0 of the SEA.

6. Describe alternatives to the proposed action which would reduce or avoid environmental damage. Alternatives are described in Section 4.0 of the SEA.

7. Describe all measures to be taken during and after the completion of the proposed project to reduce detrimental affects. See Section 5.0 of the SEA.

8. Describe all permanent environmental impacts that cannot be avoided. **See Section 5.12 of the SEA.**

9. Submit detailed evaluation of impact of the proposed project on the following:

A. Value of tidal ebb and flow.

1. Production value: carrying organic matter to adjacent estuaries and coastal waters which serve as breeding areas for certain animal species (especially fish and shellfish): See Sections 5.4, and 5.5 of SEA.
2. Value as a natural protective system of absorption of storm wave energy, flood waters, and heavy rainfall, thereby decreasing flood and erosion damage. The purpose of this project is to prevent the ongoing erosion which probably has damaged the wetland that was on this site. See Section 1.0, 2.0, 3.0 and 4.0 of SEA.
3. The preventing of silting in certain harbors and inlets thereby reducing dredging. This project will reduce erosion and siltation.
4. Removal and recycling of inorganic nutrients. The rock of the breakwater are porous and there will be gaps the will allow the exchange of inorganic nutrients.
5. Effect on the estuarine waters. See Section 5.2 of the SEA.

A. Habitat Value.

1. Habitat for resident species of wildlife including furbearers, invertebrates, finfish. See Sections 5.4 and 5.5 of the SEA. No significant impacts are expected to occur to furbearers.
2. Habitat for migratory wildlife species including waterfowl, wading birds, shorebirds, passerines, finfish and shrimp. See Sections 5.4, and 5.6. of the SEA. The breakwater should provide a protected shallow water/intertidal area that will benefit these species.

3. Rearing area, nesting area, breeding grounds for various species. See Section 5.6 of the SEA.
4. Habitat for rare or endangered species. See Section 5.7 of the SEA.
5. Presence of plants or animals known to be rare generally, or unique to the particular location. See Section 5.7 of the SEA.
6. Presence of plants or animals near the limits of their territorial range. No significant impact is expected to occur.
7. Presence of unique geological or wetland features. None known to occur.

C. Aesthetic Effect: The restoration of the breakwater should improve the visual appearance of the area.

D. Impact of Supporting Facilities. None known.

E. Effect on Neighboring Land Uses. The proposed project is consistent to neighboring land use in the state park of historic preservation and recreation.

F. Federal, State, Regional, County and Municipal Comprehensive Plans. This project is consistent with long range plans to develop this state park with a focus on historic preservation.

G. Economic Impact. This project should have a net positive economic impact by increasing visitation to the state park, which will benefit neighboring communities.

Environmental Resources Branch

Ms. Sarah Cooksey
Delaware Coastal Management Program
Division of Soil and Water Conservation
Delaware Department of Natural Resources & Environmental Control
89 Kings Highway, P.O. Box 1401
Dover, Delaware 19903

Dear Ms. Cooksey:

The purpose of this letter is to request Federal consistency concurrence with the Delaware Coastal Management Program (DCMP) pursuant to Section 307 (c) of the Coastal Zone Management Act, as amended, for the plan as proposed in the document entitled: *Supplemental Environmental Assessment Fort Delaware State Park Erosion Control Project (North Shoreline), Pea Patch Island Off of Delaware City, New Castle County, Delaware* (Enclosure 1).

The United States Army Corps of Engineers has evaluated the construction of a breakwater to protect a portion of historic Fort Delaware State Park that has been impacted by erosion, and to prevent further erosion to this area on Pea Patch Island, New Castle County, Delaware.

The proposed action is to protect the eroding northeast shoreline of Pea Patch Island (approximately 1,600 feet of shoreline) and involves stone rubble breakwater construction. The new breakwater will be approximately 1,600 feet long, 60 feet wide, and 14 feet high, and consist of approximately 14,500 cubic yards of rip-rap. The District is also presenting a conceptual plan to mitigate for all wetland impacts (approximately 5.36 acres) sustained by the erosion control project on Pea Patch Island. The Corps will enhance a minimum of 10 acres with the potential for further enhancement if funding is authorized. This site is located on land owned by the District between the Delaware River and the Reedy Point North Confined Disposal Area.

A consistency review was performed by this office based on the DNREC guidance document: *Delaware Coastal Management Program - Comprehensive Update and Routine Program Implementation, March, 1993*. After a detailed review of applicable regulations and policies associated with the construction design for the aforementioned project, it is our finding that the proposed activity complies with Delaware's approved coastal management program and will be conducted in a manner consistent with the program. A table and outline of the applicable

Delaware CMP policies is enclosed with this letter for your consideration (Enclosure 2).

Please review the enclosed information and provide your concurrence with our determination of Coastal Zone Consistency by July 30, 2003. Extra copies of the environmental assessment are available upon request. If you have any questions regarding this project, please contact John Brady of the Environmental Resources Branch at (215) 656-6554.

Sincerely,

Minas M. Arabatzis
Chief, Planning Division

Enclosures

MFR: Coordinated with CENAP-EN-MM (Penrose) and CENAP-OP (Groff). Letter to DNREC requesting CZM consistency determination for the Fort Delaware State Park Erosion Control Project.

**CONSISTENCY REVIEW
APPLICABLE DELAWARE COASTAL MANAGEMENT POLICIES SUMMARY**

POLICIES	APPLICABLE SECTIONS
RESOURCES SUBJECT TO MANAGEMENT	
5.A.1 WETLANDS MANAGEMENT	--General CMP Policies for Wetlands Management Policy #'s 1, 2,4,5 & 6 --Specific CMP Policies for Wetlands Management Policy #'s 8, 9, 10,11, 12 & 13
5.A.3 COASTAL WATER MANAGEMENT	--General CMP Policies for Coastal Waters Management Policy #'s 1-4, 5 --Specific CMP Policies for Coastal Waters Management Policy #'s 6,7,10,11,12, 32, 35, & 38
5.A.4 SUBAQUEOUS LANDS AND COASTAL STRIP MANAGEMENT	--General CMP Policies for Subaqueous Lands and Coastal Strip Management Policy # 1 --Specific CMP Policies for Subaqueous Lands and Coastal Strip Management Policy #'s 15,16,17,18,19,21,22,23,& 24
5.A.5 CMP POLICIES FOR BORROW PITS	NONE
AREAS OF SPECIAL INTEREST	
5.B.1 "PUBLIC LAND" MANAGEMENT	Policy #1-5
5.B.2 NATURAL AREAS MANAGEMENT	Policy #1
5.B.3 FLOOD HAZARD AREAS MANAGEMENT	NONE
5.B.4 PORT OF WILMINGTON MANAGEMENT	NONE
OTHER AREAS OF INTEREST	
5.C.1 WOODLANDS AND AGRICULTURAL LANDS POLICIES	NONE
5.C.2 CMP HISTORIC AND CULTURAL AREAS POLICIES	Policy #'s 1 & 3
5.C.3 CMP LIVING RESOURCE POLICY	Policy #'s 1,4,5, 6 7,& 10
5.C.4 CMP MINERAL RESOURCE POLICY	NONE
5.C.5 CMP STATE OWNED COASTAL RECREATION AND CONSERVATION LANDS POLICY	Policy #1
5.C.6 CMP PUBLIC TRUST DOCTRINE POLICY	NONE
DEVELOPMENT ISSUES	
5.D.2 CMP DEVELOPMENT POLICIES	NONE
5.D.3 ENERGY FACILITIES	NONE
5.D.4 PUBLIC INVESTMENT POLICIES	NONE
5.D.5 CMP POLICIES FOR RECREATION AND TOURISM	Policies 1-3
5.D.6 CMP POLICIES FOR NATIONAL DEFENSE AND	NONE

AEROSPACE FACILITIES	
5.D.7 CMP POLICIES FOR TRANSPORTATION FACILITIES	NONE
5.D.8 CMP POLICIES FOR AIR RESOURCES	Policy #1
5.D.9 CMP POLICIES FOR WATER SUPPLY MANAGEMENT	NONE
5.D.11 CMP POLICIES FOR WASTE DISPOSAL	NONE
5.E COASTAL MANAGEMENT COORDINATION	NONE

THE FOLLOWING POLICIES WERE CONSIDERED TO BE APPLICABLE TO THE
CONSTRUCTION OF THE PROPOSED FORT DELAWARE STATE PARK
EROSION CONTROL PROJECT (NORTH SHORELINE)

5.A.1. WETLANDS MANAGEMENT

General CMP Policies for Wetlands Management

#1. [Authority- 7 Delaware Code 6602] Approximately 2.2 acres of the area to be filled was mapped as vegetated wetlands in 1988. The area is intertidal. DNREC, Parks and Recreation, and the Corps will attempt to provide the additional 2.2 acres of mitigation, based on the cost and the availability of future funding. For these reasons this project is considered to be consistent with these policies. See Sections 5.3 and 5.11 of the Supplemental Environmental Assessment (SEA).

#2. [Authority- 7 Delaware Code 6602, 6003(a)(2), 6119, and 4001]

#4. [Authority-Executive Order No. 56, May 1988]

In order to restore protect the shoreline of this portion of Pea Patch Island this alternative causes the least impacts while still protecting the shoreline. See Section 4.0 of the SEA.

#5. [Authority-Executive Order No. 56, May 1988]

#6. [Authority- Executive Order No. 56, May 1988]

Specific CMP Policies for Wetlands Management

#8. [Authority- 7 Delaware Code 6603(h)]

#9. [Authority- Executive Order No. 61; 7 Delaware Code, Chapter 73 and 75; and 29 Delaware Code, Chapter 92]

#10. [Authority-7 Delaware Code 6604 and 6606; DNREC Wetlands Regulations, Section 1.04, revised June 29,1984]

#11. [Authority- 7 Delaware Code 6604; DNREC Wetlands Regulations]

The Philadelphia District has applied for a 401 Water Quality Certificate from the Wetlands and Subaqueous Lands Section, Division of Water Resources. No work will be done before these authorizations are obtained.

#12. [Authority-Executive Order No.61]

Filling of intertidal habitat does occur along Delaware Bay. Although the amount of filling that occurs is not known, Federal and state regulatory agencies have decreased the magnitude of this activity. On the other hand, at many locations in Delaware Bay, tidal marshes have been eroding, creating more shallow water habitat. In addition, if Pea Patch Island is allowed to continue to erode, the nationally significant cultural resources as well as the heron rookery will be in jeopardy. The cumulative impacts of filling the 2.2 acres should not have a significant impact on the aquatic environment, since mitigation is proposed.

#13. [Authority- DNREC Wetlands Regulations, Section 2, Amended June 29,1984]

No explanation is required.

5.A.3. COASTAL WATERS MANAGEMENT

General CMP Policies for Coastal Waters Management

- #1. [Authority-7 Delaware Code 6001 (a)(2 & 3)]
- #2. [Authority-7 Delaware Code 6001 (a)(5) and 6001(c)(2)]
- #3. [Authority-7 Delaware Code 6001 (a)(4)]
- #4. [Authority DNREC Regulations, Surface Water Quality Standards, Section 1.1, Amended February 2, 1990]

Stone breakwater construction will have a short-term effect on turbidity levels from the placement of stones for the breakwater. The river current in this area should carry the limited turbidity out of the area quickly. High turbidity levels can stress aquatic organisms by clogging respiratory organs. The turbidity may also decrease hunting capacity of visual predators. This alternative should have limited or no impact on pH, nutrient levels, bacteria, or DO. It also should not change the DRBC characterization of the water as fair to good. See Section 5.2 of the SEA.

Specific CMP Policies for Coastal Waters Management

- #5. [Authority-State of Delaware, Surface Water Quality Standards, Section 10, Amended February 2, 1990]
- #6. [Authority-State of Delaware, Surface Water Quality Standards, Section 3.1, Amended February 2, 1990]
- #7 [Authority-State of Delaware, Surface Water Quality Standards, Section 3.2, Amended February 2, 1990]
- #10. Authority-State of Delaware, Surface Water Quality Standards, Section 3.4, Amended February 2, 1990]
- #11. [Authority-State of Delaware, Surface Water Quality Standards, Section 3.6, Amended February 2, 1990]
- #12. [Authority-State of Delaware, Surface Water Quality Standards, Section

4.1, Amended February 2, 1990]

The project, as proposed, was determined to have temporary minor adverse impacts to water quality during placement of stone fill. Based on the coarse nature of the rip rap involved, and the lack of contaminants, it is expected that State Water Quality Standards would not be exceeded during and after project construction. Therefore, no significant water quality impacts are expected as a result from implementation of the proposed project. Based on this determination, the proposed project would be consistent with the preceding policies. A more detailed discussion on water quality impacts of the proposed project is provided in Sections 5.2 and 7.0 of the SEA.

- #32. [Authority-DNREC Regulations Governing the Control of Water Pollution, Amended June 23, 1983, Section 3.04(a)]

No evidence of chemical warfare materials storage, usage, or disposal at Fort Delaware was found. See Section 3.6 of Final Environmental Assessment (EA) dated May 1999..

- #35. [Authority-Delaware Sediment and Stormwater Regulations, dated January 23, 1991, Section 8(1)]
#38. [Authority-Delaware Sediment and Stormwater Regulations dated January 23, 1991, Section 10(2)(B)]

A sediment and erosion control plan will be submitted for approval prior to commencement of proposed project. The proposed project would be consistent with the preceding policies.

5.A.4. SUBAQUEOUS LANDS AND COASTAL STRIP MANAGEMENT

General CMP Policies for Subaqueous Lands and Coastal Strip Management

- #1. [Authority-7 Delaware Code 7001 and 6201]
[Authority- 7 Delaware Code 6602]
Approximately 2.2 acres of the area to be filled was mapped as vegetated wetlands in 1988. The area is intertidal. DNREC, Parks and Recreation, and the Corps will attempt to provide the additional 2.2 acres of mitigation, based on the cost and the availability of future funding. For these reasons this project is consistent with these policies. See Section 5.11 of the SEA. The proposed project would be consistent with the preceding policies.
- #15. [Authority-7 Delaware Code 6119(a)]
#16. [Authority-7 Delaware Code 6119(b)]
It is expected that the proposed project would not result in any avoidable

pollution or avoidable contamination of the ocean, waters covering submerged lands, and beaches. The proposed project would be consistent with the preceding policies.

- #17. [Authority-7 Delaware Code 7201]
- #18. [Authority-7 Delaware Code 7205]
- #19. [Authority -State of Delaware Regulations Governing the Use of Subaqueous Lands, amended September 2, 1992, Section 1.02(A)(1)]
- #21. [Authority-State of Delaware Regulations Governing the Use of Subaqueous Lands, amended September 2, 1992, Section 1.04(B)]
- #22. [Authority-State of Delaware Regulations Governing the Use of Subaqueous Lands, amended September 2, 1992, Section 3.01(A)]
- #23. [Authority-State of Delaware Regulations Governing the Use of Subaqueous Lands, amended September 2, 1992, Section 3.01(B)]
- #24. [Authority-State of Delaware Regulations Governing the Use of Subaqueous Lands, dated September 2, 1992, Section 3.01(C)]

These policies state that DNREC shall consider the environment and the public interest for any proposed activity that might affect the use of subaqueous lands. Resources described in these policies are discussed in the SEA that is attached for review by DNREC. The Philadelphia District has applied for a 401 Water Quality Certificate from the Wetlands and Subaqueous Lands Section, Division of Water Resources. No work will be done before these authorizations are obtained.

5.B.1 "PUBLIC LANDS" MANAGEMENT

General CMP Policies for "Public Lands" Management

- #1-5 [Authority 1-5 - The authority for management of these resource areas is vested primarily in DNREC pursuant to Title 7, chapters 45 and 47 of the Delaware Code]

The restoration of Fort Delaware State Park is consistent with these policies.

5.B.2 NATURAL AREAS MANAGEMENT

General CMP Policies for Natural Areas Management

- #1 [Authority - 7 Delaware Code 7303, 7302(6) and 7306]

The Fort Delaware State Park Restoration Project will be consistent with these policies by constructing the project during periods when potential disturbance to the wading bird rookery will be minimized and attempting to avoid and minimize impacts to the yellow-crowned night heron

rookery. See Section 5.6 of the SEA.

5.C.2 CMP HISTORIC AND CULTURAL AREAS POLICIES

- #1 The project will protect and restore a portion of Fort Delaware State Park. This is consistent with this policy.
- #3. Coordination with the Delaware Division of Historical and Cultural Affairs is being conducted and will continue with the circulation of the Environmental Assessment. A copy of the SEA was sent to the Delaware Division of Historical and Cultural Affairs/State Historic Preservation Office (SHPO) for review and comment. The proposed project will be in compliance with Section 106 of the National Historic Preservation Act after it is approved by Delaware SHPO. See the cultural resource sections of SEA (Section 5.8) for a more detailed discussion.

5.C.3. CMP LIVING RESOURCES POLICIES

- #1. Although the project will destroy some aquatic habitat, over the long term it will help protect the nationally significant heron rookery by stopping erosion (See Sections 5.4 and 5.5 of the SEA).
- #4. Approximately 2.2 acres of the area to be filled was mapped as vegetated wetlands in 1988. The area is intertidal. DNREC, Parks and Recreation, and the Corps will attempt to provide the additional 2.2 acres of mitigation, based on the cost and the availability of future funding. For these reasons this project is consistent with these policies. See Section 5.11 of the SEA.
- #5 See response to #1, above.
- #6. No impacts are expected to occur, since there are no known Federally listed threatened or endangered species within the immediate project areas. (See Section 5.7 of the SEA).
- #7. No significant impacts to finfish and shellfish are expected (See Sections 5.4 and 5.5 of the SEA).
- #10. Consultation and coordination with DNREC is ongoing with this project. See Sections 4.0 of the SEA for a discussion of alternatives.

5.C.5 CMP STATE OWNED COASTAL RECREATION AND CONSERVATION LANDS POLICY

- #1. The project is consistent with this policy by restoring and protecting Fort Delaware State Park from continuing erosion.

5.D.5. CMP POLICIES FOR RECREATION AND TOURISM

- #1-3 The project is consistent with this policy by restoring and protecting Fort Delaware State Park from continuing erosion.

5.D.8. CMP POLICIES FOR AIR QUALITY MANAGEMENT

- #1. Minor short-term impacts to air quality would result from the construction phase of the stone breakwater, excavation of the swale and ditches, and filling behind the breakwater. Ambient air quality would also be temporarily degraded, but emission controls and limited duration aid in minimizing the effects. No Long-term significant impacts to the local air quality are anticipated. See Section 5.1 of the SEA.

APPENDIX C

PERTINENT CORRESPONDANCE AND COORDINATION

Environmental Resources Branch

Mr. Tony Hummell
Division of Air and Waste
Department of Natural Resources & Environmental Control
89 Kings Highway
Dover, DE 19901

Dear Mr. Hummell:

In accordance with Section 102 of the National Environmental Policy Act of 1969, as amended, enclosed for your information is a copy of the *Draft Supplemental Environmental Assessment, Fort Delaware State Park Erosion Control Project (North Shoreline), Pea Patch Island Off of Delaware City, New Castle County, Delaware*, dated July 2003.

The United States Army Corps of Engineers has evaluated the construction of a breakwater to protect a portion of historic Fort Delaware State Park that has been impacted by erosion, and to prevent further erosion to this area on Pea Patch Island, New Castle County, Delaware. This environmental assessment supplements environmental documents that were prepared in May 1999, June 2000, and May 2002.

The proposed action is to protect the eroding northeast shoreline of Pea Patch Island (approximately 1,600 feet of shoreline) and involves stone rubble breakwater construction. The new breakwater will be approximately 1,600 feet long, 60 feet wide, and 14 feet high, and consist of approximately 14,500 cubic yards of rip-rap.

Thank you for your help in the development of this project. Please provide any comments by July 30, 2003. Extra copies of the report are available upon request. If you have any questions regarding this project, please contact John Brady of the Environmental Resources Branch at (215) 656-6554.

Sincerely,

Minas M. Arabatzis
Chief, Planning Division

Enclosure

MFR: Coordinated with CENAP-EN-MM (Penrose) and CENAP-OP (Groff). Letter transmitting Supplemental EA to agencies that participated in plan development and providing comment period. See attached mailing list.

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Dover, Delaware 19901



**US Army Corps
of Engineers**

Philadelphia District

Public Notice

Public Notice No.
CENAP-PL-E-03-02

Date
July 1, 2003

Internet (<http://www.nap.usace.army.mil/cenap-pa/nrpn.htm>).

In Reply Refer to: Environmental Resources Branch

**SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
FORT DELAWARE STATE PARK EROSION CONTROL PROJECT
NORTH SHORELINE
PEA PATCH ISLAND OFF OF DELAWARE CITY,
NEW CASTLE COUNTY, DELAWARE**

INTRODUCTION: Pursuant to Section 102 of the National Environmental Policy Act, Section 10 of the Rivers and Harbors Act, and Section 404 of the Clean Water Act, NOTICE IS HEREBY GIVEN THAT, the Philadelphia District, U.S. Army Corps of Engineers has completed a Supplemental Environmental Assessment (SEA) that has evaluated the construction of a breakwater for the erosion control project to restore a portion of historic Fort Delaware State Park that has been impacted by erosion, and to prevent further erosion to this area on Pea Patch Island, New Castle County, Delaware. This environmental assessment supplements ones that were prepared in May 1999, June 2000, and May 2002. Figures 1 shows the location of the project. This project is being done under the authority of Section 110 of the National Historic Preservation Act (53 FR 4727-46).

PROJECT SPECIFICATIONS: The proposed action is to protect and restore the eroding breakwater and shoreline north of the newly constructed breakwater on Pea Patch Island (approximately 1,600 feet of shoreline) and involves placement of stone rubble and filling of wetlands. The restored stone rubble breakwater will exhibit an exterior appearance similar to the original breakwater and will be constructed along the line of the original breakwater. The new breakwater will be approximately 1,600 feet long, 60 feet wide, and 14 feet high, and consist of approximately 14,500 cubic yards of rip-rap (Figures 2, 3 and 4). For mitigation, the Corps will enhance a minimum of 10 acres with the potential for further enhancement if funding is authorized. This site is located on land owned by the District between the Delaware River and the Reedy Point North Confined Disposal Area (Figure 5).

RESULTS OF ENVIRONMENTAL ASSESSMENT: In accordance with the National Environmental Policy Act of 1969, a Supplemental Environmental Assessment has been prepared for this project. Impacts to Water Quality have been evaluated in accordance with the Section 404(b)(1) guidelines of the Clean Water Act, and are not adverse.

SUBJECT: CENAP-PL-E-03-02

1. In accordance with Section 401 of the Clean Water Act, approvals are being requested from the Delaware Department of Natural Resources and Environmental Control (DNREC), including Section 401 Water Quality Certification.
2. In accordance with Section 307 (c) of the Coastal Zone Management Act of 1972, an activity affecting land or water uses in a State's coastal zone must comply with the State's Coastal Zone Management Program. A certification of compliance is being requested from the Delaware Department of Natural Resources and Environmental Control.
3. It has been determined that the proposed work would not affect listed species or their critical habitat pursuant to Section 7 of the Endangered Species Act as amended. The project has been coordinated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.
4. The project changes as detailed in the supplemental EA have the potential to impact cultural resources. Section 106 consultation is ongoing and will be concluded prior to any project activity.
5. An Essential Fish Habitat Evaluation that was performed under provisions of the reauthorized Magnuson-Stevens Fishery Conservation and Management Act of 1996 (P.L. 94-265) for the June 2000 Supplemental EA, determined that no significant impacts would occur to species with Fishery Management Plans and their important prey species. This project is not expected to change the results of this determination.
6. An evaluation of projected emissions that would result during construction of this project was prepared to address the requirements of General Conformity of the Clean Air Act (42 U.S.C. 7401 et seq). The evaluation indicates that emissions from the project will not exceed threshold levels and the project will be in conformity with the Clean Air Act.
7. All practicable means to avoid or minimize adverse environmental effects have been incorporated into the recommended plan.

COORDINATION: The Supplemental Environmental Assessment for the project is being coordinated with the U.S. Environmental Protection Agency Region III, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Delaware State Historic Preservation Officer, and the Delaware Department of Natural Resources and Environmental Control (DNREC).

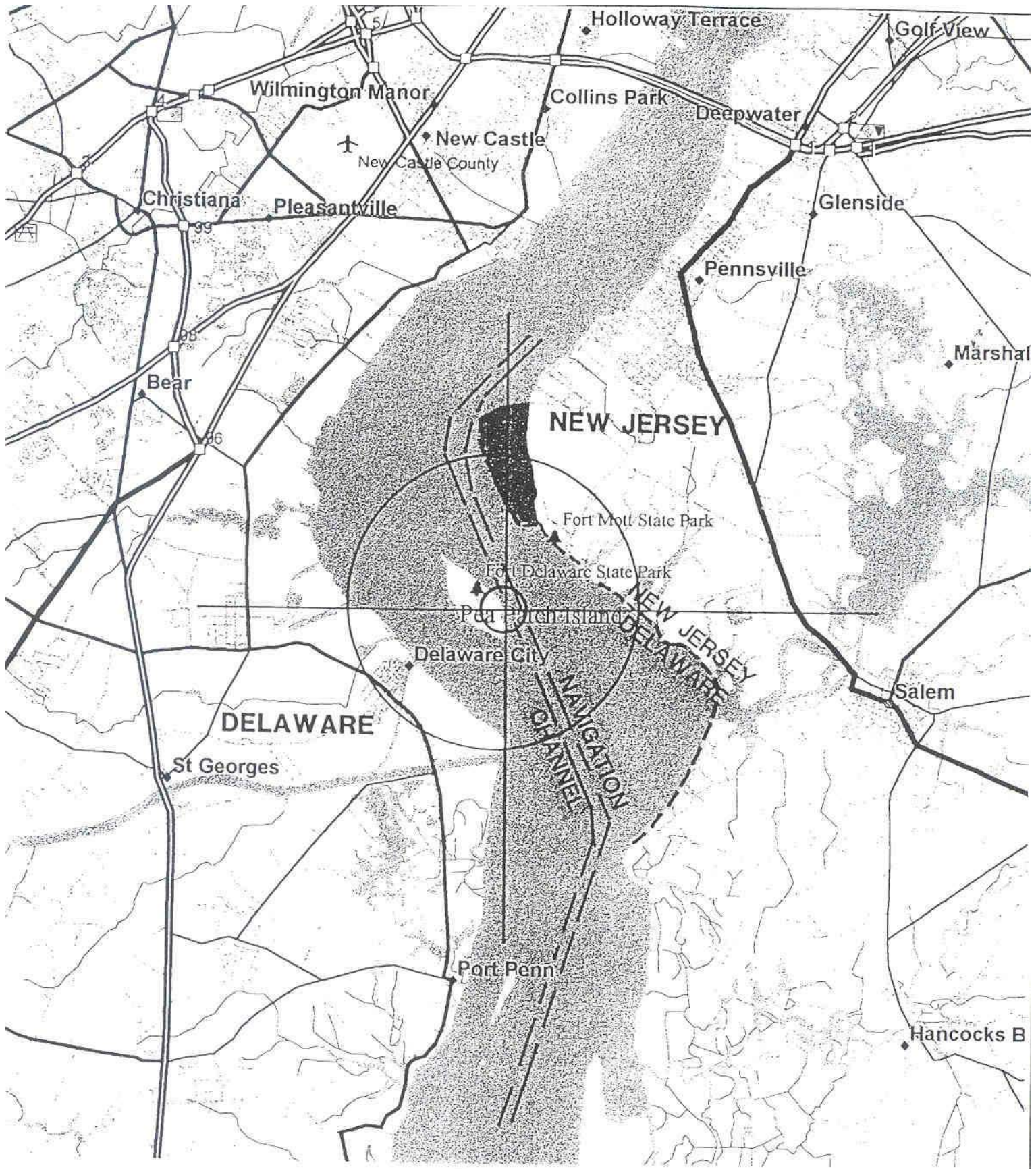
PUBLIC COMMENT: The public and all agencies are invited to comment on this proposal between July 1, 2003 and July 30, 2003. Any person may request, in writing, to the District Engineer, within the comment period specified in this notice, that a public hearing be held to consider this proposal. Requests for a public hearing shall state, in detail, the reasons for holding a public hearing.

SUBJECT: CENAP-PL-E-03-02


Additional information and copies of the Supplemental Environmental Assessment are available upon request by calling John Brady (215) 656-6555 or by writing the Environmental Resources Branch, U.S. Army Corps of Engineers, Wanamaker Building, 100 Penn Square East, Philadelphia, Pennsylvania 19107-3390. This public notice and the Supplemental Environmental Assessment are available on the world wide web at the address listed in the title block. More detailed information on this work is also available for public review at the Philadelphia District Office.


Minas M. Arabatzis
Chief, Planning Division

**U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT
ATTN: CENAP-PL-E
WANAMAKER BUILDING
100 PENN SQUARE EAST
PHILADELPHIA, PA 19107-3390**



NOTE: FINAL DESIGN REQUIRED FOR CONSTRUCTION

S.T. HUDSON ENGINEERS, INC.
 PROFESSIONAL ENGINEERS & CONSULTANTS

 800 Hudson Square
 P.O. Box 9106
 Camden, N.J. 08101
 Fax No. 609-342-6323 609-342-6600

DESIGNED	DRAWN	U.S. ARMY ENGINEER DISTRICT, PHILADELPHIA	
	P.J. McDERMOTT	CORPS OF ENGINEERS	
SUBMITTED		PHILADELPHIA, PENNSYLVANIA	
CHIEF, C & S SECTION		 PEA PATCH ISLAND, FORT DELAWARE STATE PARK NEW CASTLE COUNTY, DELAWARE BANK STABILIZATION AND RESTORATION	
REVIEWED			
S & OH MANAGER			
RECOMMENDED			
CHIEF, DESIGN BRANCH			
APPROVED		PROJECT SITE	
CHIEF, ENGINEERING DIVISION		SIZE	DRAWING NO.
FILE NAME:		A	
DATE:	25 AUGUST 1998	SCALE: NONE	FIGURE 1

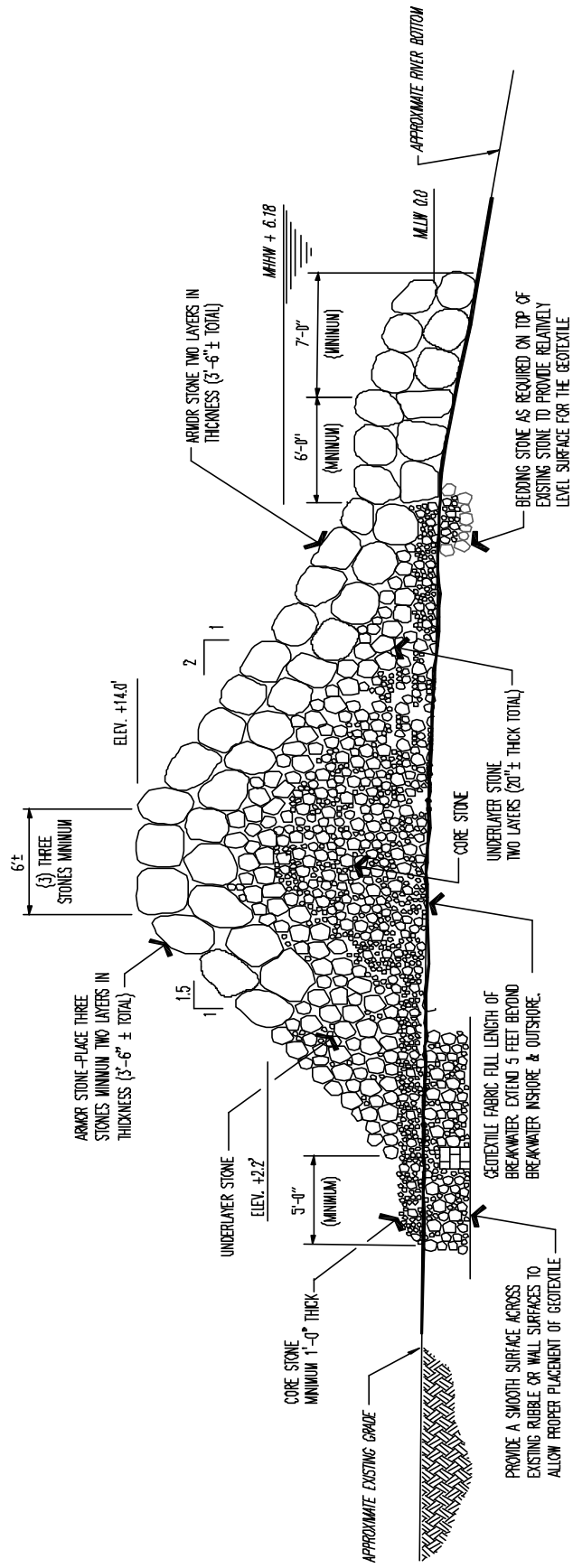


Figure 3. Typical Section of Breakwater (2:1 Slope).

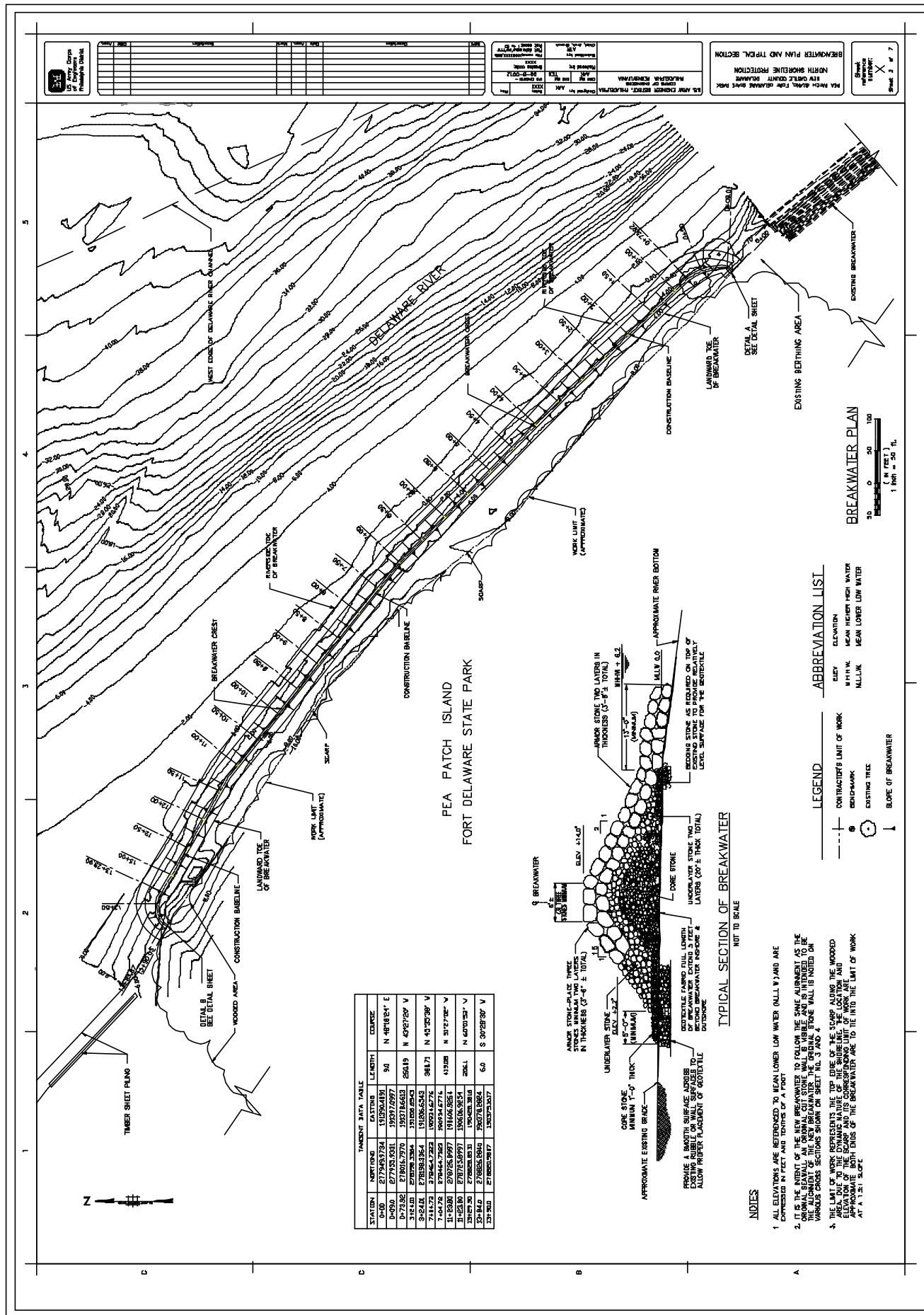
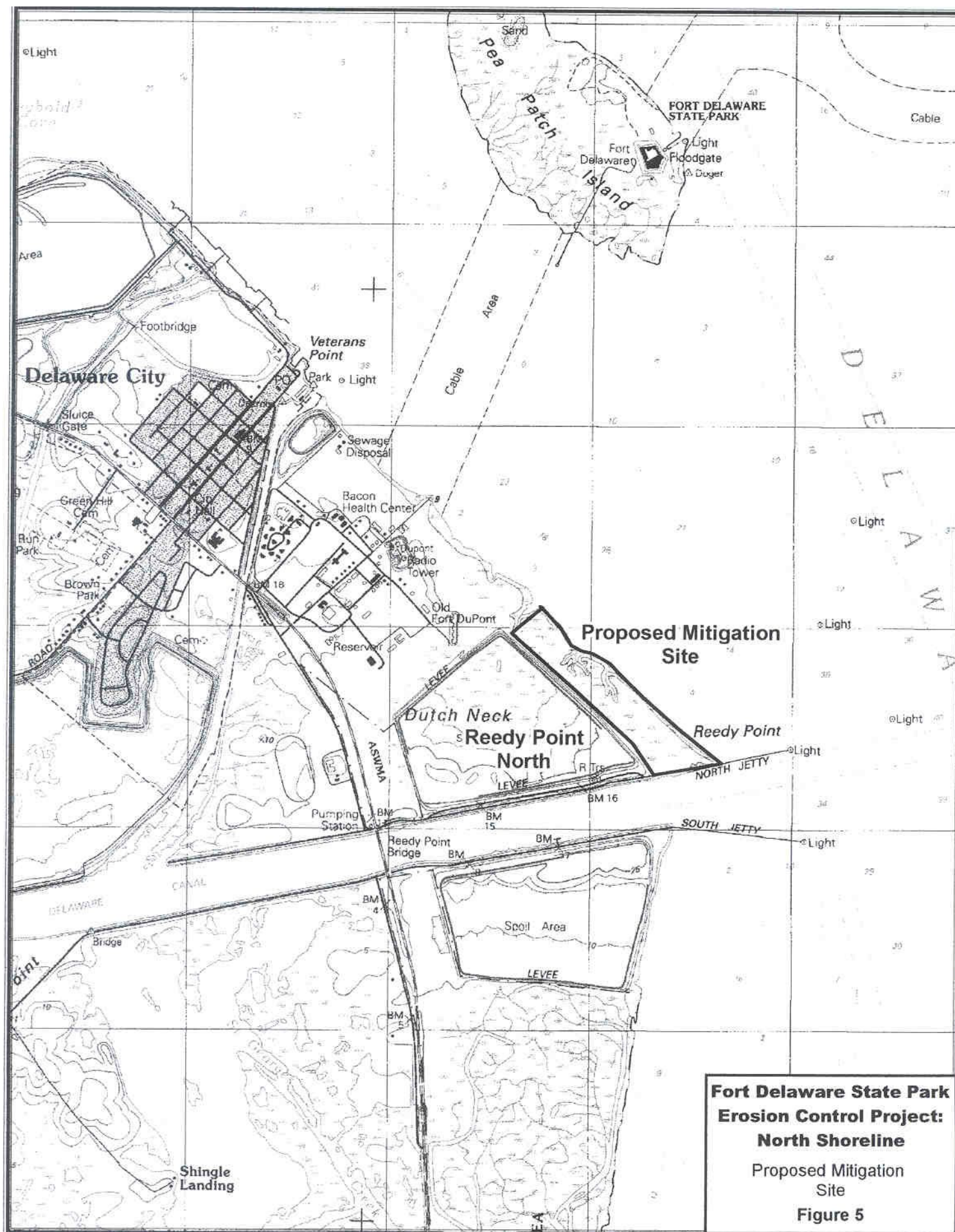


Figure 4. Breakwater Plan and Typical Section



**Fort Delaware State Park
Erosion Control Project:
North Shoreline**
Proposed Mitigation
Site
Figure 5

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Total: 127

APPENDIX D

General Conformity Review and Emission Inventory for the Pea Patch Island Erosion Control Project: North Shoreline.

General Conformity Review and Emission Inventory for the Pea Patch Island Erosion Control Project: North Shoreline

Table 1. Project Emission Sources and Estimated Power

hp-hr = # of engines*hp*LF*hrs/day*days of operation

Load Factor (LF) represents the average percentage of rated horsepower used during a source's operational profile.

Equipment/Engine Category	# of engines	hp	LF	days of	
				hrs/day	operation hp-hr
950 Loader	1	170	0.68	6	34
325 Excavator	1	168	0.70	6	30
Tugboat - Prime Engine	2	750	0.40	10	48
Tugboat - Auxiliary Engine	2	200	0.20	10	48
Crew/Survey Workboat - Prime Engine	1	100	0.40	20	90
Crew/Survey Workboat - Auxiliary Engine	1	40	0.20	20	90
Derrick Barge - Prime Engine	2	150	0.40	10	30
Derrick Barge - Auxiliary Engine	2	25	0.20	10	30

Load Factors taken from the General Conformity Review and Emission Inventory for the Delaware River Main Channel Deepening Project. (May 2003). Prepared for the U.S. Army Corps of Engineers, Philadelphia District by Moffatt & Nichol Engineers.

Load Factors determined from EPA's NONROAD model activity data file.

Equipment sources: 2270002036 - Diesel Excavators

2270002060 - Diesel Rubber Tire Loaders

General Conformity Review and Emission Inventory for the Pea Patch Island Erosion Control Project: North Shoreline

Table 2. Emission Factors

Emission Factors taken from the General Conformity Review and Emission Inventory for the Delaware River Main Channel Deepening Project. (May 2003). Prepared for the U.S. Army Corps of Engineers, Philadelphia District by Moffatt & Nichol Engineers.
Emission Factors determined from EPA's NONROAD model emission factor data files. Assumes Tier 1 EPA engine standards.

Equipment/Engine Category	NOx Emission Factors (g/hp-hr)	VOC Emission Factors (g/hp-hr)
950 Loader	5.664	0.376
325 Excavator	6.667	0.724
Tugboat - Prime Engine	8.162	0.197
Tugboat - Auxiliary Engine	8.839	0.556
Crew/Survey Workboat - Prime Engine	8.162	0.197
Crew/Survey Workboat - Auxiliary Engine	8.839	0.556
Derrick Barge - Prime Engine	8.162	0.197
Derrick Barge - Auxiliary Engine	8.839	0.556

General Conformity Review and Emission Inventory for the Pea Patch Island Erosion Control Project: North Shoreline

Table 3. Emission Estimates (NOx)

Emissions (g) = Power Demand (hp-hr) * Emission Factor (g/hp-hr)

Emissions (tons) = Emissions (g) * (1 ton/907200 g)

Equipment/Engine Category	hp-hr	EF (g/hp-hr)	Emissions (tons)
950 Loader	23582.4	5.664	0.147
325 Excavator	21168	6.667	0.156
Tugboat - Prime Engine	288000	8.162	2.59
Tugboat - Auxiliary Engine	38400	8.839	0.37
Crew/Survey Workboat - Prime Engine	72000	8.162	0.65
Crew/Survey Workboat - Auxiliary Engine	14400	8.839	0.14
Derrick Barge - Prime Engine	36000	8.162	0.32
Derrick Barge - Auxiliary Engine	3000	8.839	0.03
Total NOx Project Emissions (tons) =			4.41

General Conformity Review and Emission Inventory for the Pea Patch Island Erosion Control Project: North Shoreline

Table 4. Emission Estimates (VOCs)

$$\text{Emissions (g)} = \text{Power Demand (hp-hr)} * \text{Emission Factor (g/hp-hr)}$$

$$\text{Emissions (tons)} = \text{Emissions (g)} * (1 \text{ ton}/907200 \text{ g})$$

Equipment/Engine Category	hp-hr	EF (g/hp-hr)	Emissions (tons)
950 Loader	23582.4	0.376	0.010
325 Excavator	21168	0.724	0.017
Tugboat - Prime Engine	288000	0.197	0.06
Tugboat - Auxiliary Engine	38400	0.556	0.024
Crew/Survey Workboat - Prime Engine	72000	0.197	0.02
Crew/Survey Workboat - Auxiliary Engine	14400	0.556	0.009
Derrick Barge - Prime Engine	36000	0.197	0.01
Derrick Barge - Auxiliary Engine	3000	0.556	0.002

Total VOCs Project Emissions (tons) = 0.15

Table 5. Pollutant Emissions from Employee Vehicles

Assumptions:

- Average trip distance (1 way) is 25 miles.
- Average NOx vehicle emission factor is 0.96 g/mile.
- Average VOC vehicle emission factor is 0.84 g/mile
- Work crew comprised of 10 people
- Every member of the work crew drives their own vehicle.
- Project construction period is 90 days.
- Project construction occurs 5 days per week.
- There are 4 holidays construction period.
- There are 14 weather days (no work) in a year.

Actual work days = 90 days - 24 weekend days off - 4 holidays off - 14 weather days off.

Actual work days = 48 days

NOx Calculation: 10 workers * 2 trips/work day * 48 work days * 25 miles/trip * 0.96 g of NOx/mile

Total NOx resulting from employee vehicles = 0.025 tons

VOC Calculation: 10 workers * 2 trips/work day * 48 work days * 25 miles/trip * 0.84 g of VOC/mile

Total VOCs resulting from employee vehicles = 0.022 tons.

Pollutant emissions associated with employee vehicles derived from data found in: Marine and Land-Based Mobile Source Emission Estimates for 50-Foot Deepening Project. January 2002. Prepared for The Port Authority of New York and New Jersey by Killam Associates and Starcrest Consulting Group, LLC.